

胃肠超声内镜检查

浙江大学医学院附属第一医院

消化内科、消化内镜中心

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胃肠超声内镜检查

食管

胃

十二指肠

空肠、回肠

结、直肠

胃肠超声内镜检查

食管

胃

十二指肠

空肠、回肠

结、直肠

食管疾病超声内镜检查

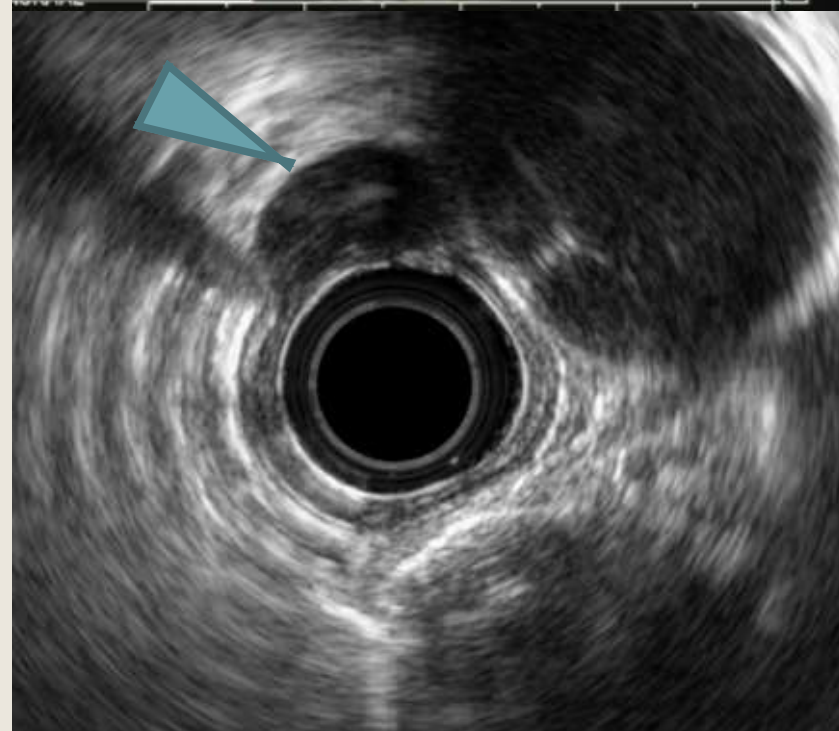
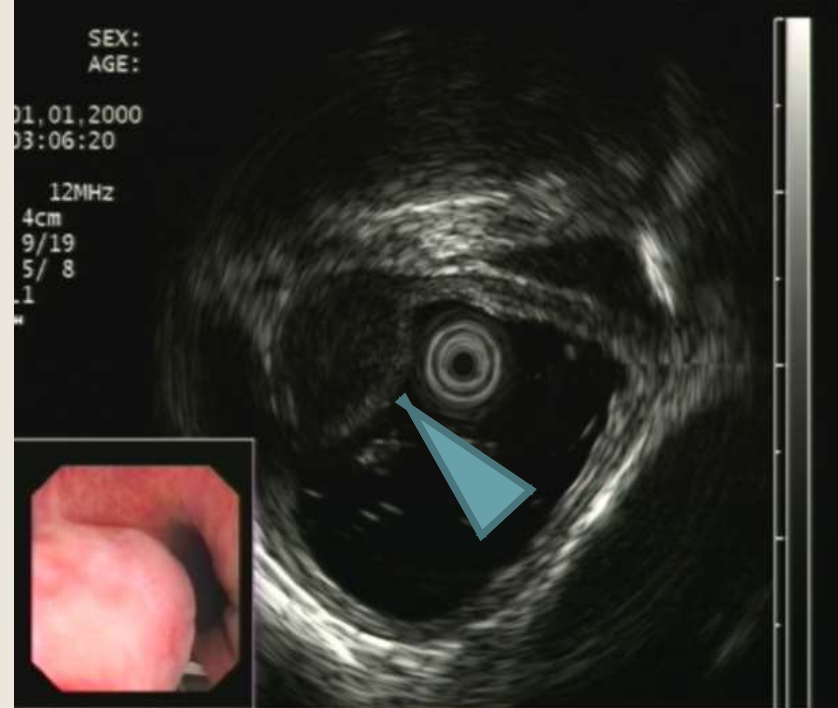
适应证：

所有食管隆起、凹陷或者增厚、狭窄性病变均是内镜超声检查的适应证，但是对于以下方面特别有诊断价值。

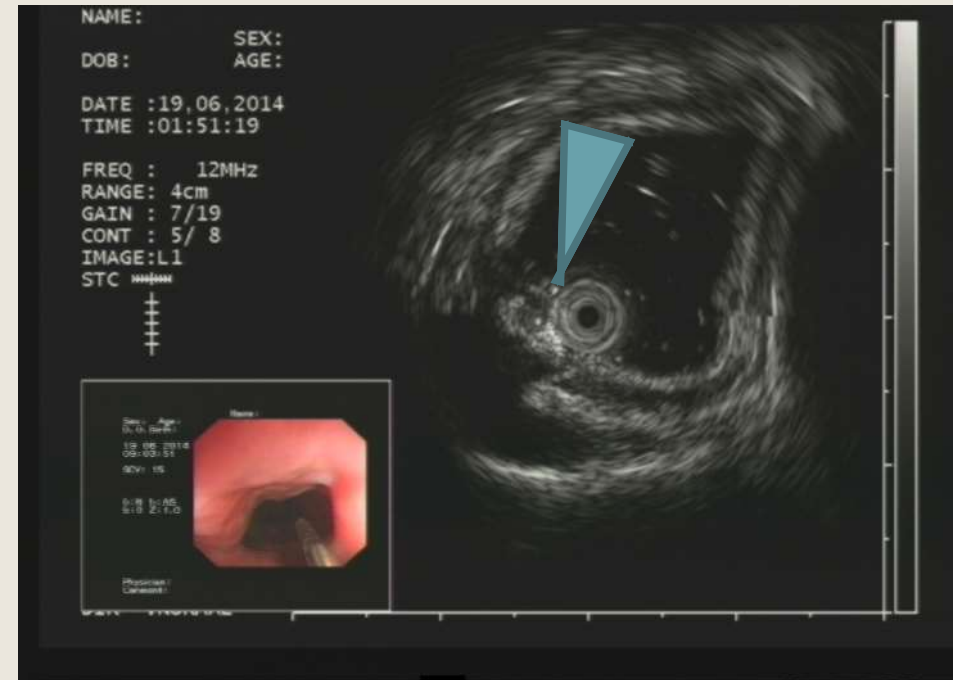
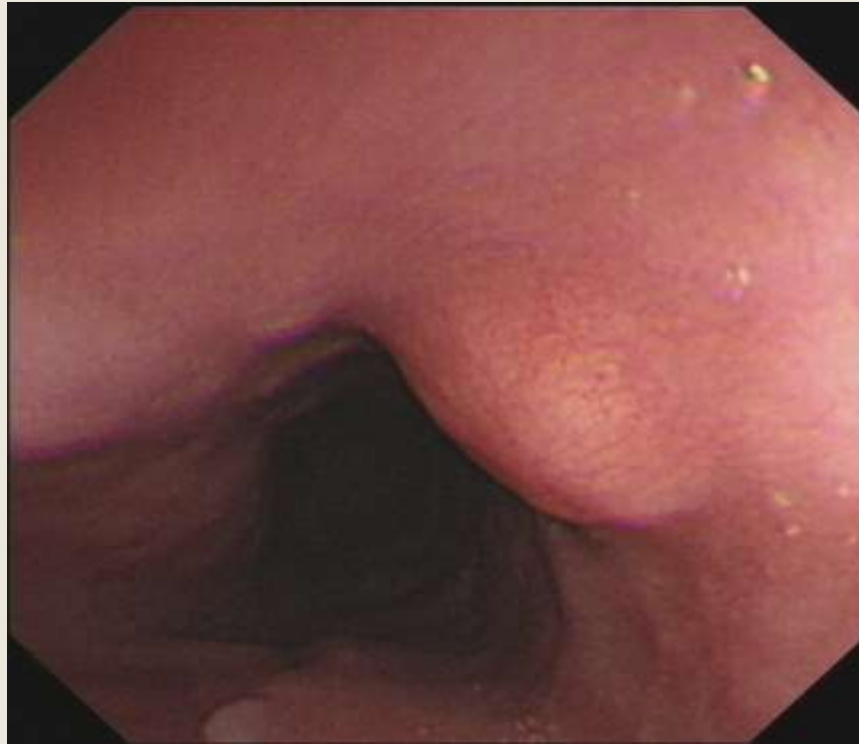
- 1、食管粘膜下病变，如食管平滑肌瘤、脉管瘤、颗粒细胞瘤、错构瘤、囊肿、脂肪瘤等的断与鉴别诊断。
- 2、食管外压性隆起的诊断与鉴别，如主动脉、（支）气管以及脊柱等生理性外压造成的改变或者食管旁肿大淋巴结等壁外病变造成的外压性隆起。
- 3、食管增厚、狭窄性病变，如贲门失迟缓症、嗜酸细胞性食管炎等增厚性疾病的辅助诊断以及食管狭窄良恶性的鉴别。
- 4、食管癌的术前TN分期、放化疗的疗效评估等。
- 5、食管曲张静脉内镜治疗前后的评估。

食管平滑肌瘤

- 起源于固有肌层或粘膜肌层
- 类圆形或椭圆形
- 可呈分叶状或环周生长
- 低回声为主，分布均匀
- 可伴钙化，单发或多发



食管平滑肌瘤（伴钙化，后伴声影）



食管脉管瘤

- 起源于粘膜下层
- 呈中等-高回声
- 内部蜂窝状无回声



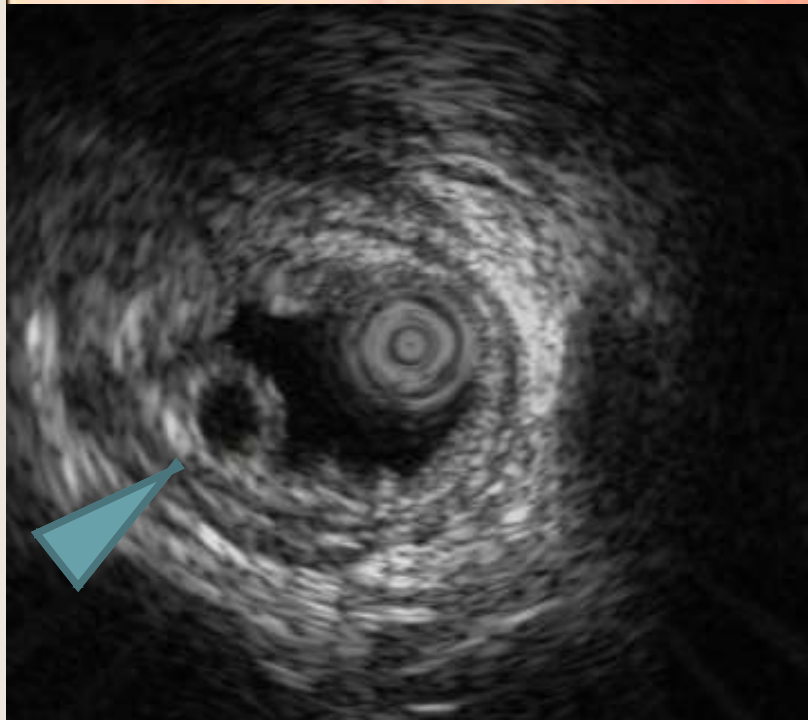
食管颗粒细胞瘤

- 起源于粘膜深层
- 类圆形或椭圆形
- 中等回声（高于平滑肌瘤）
- 分布均匀



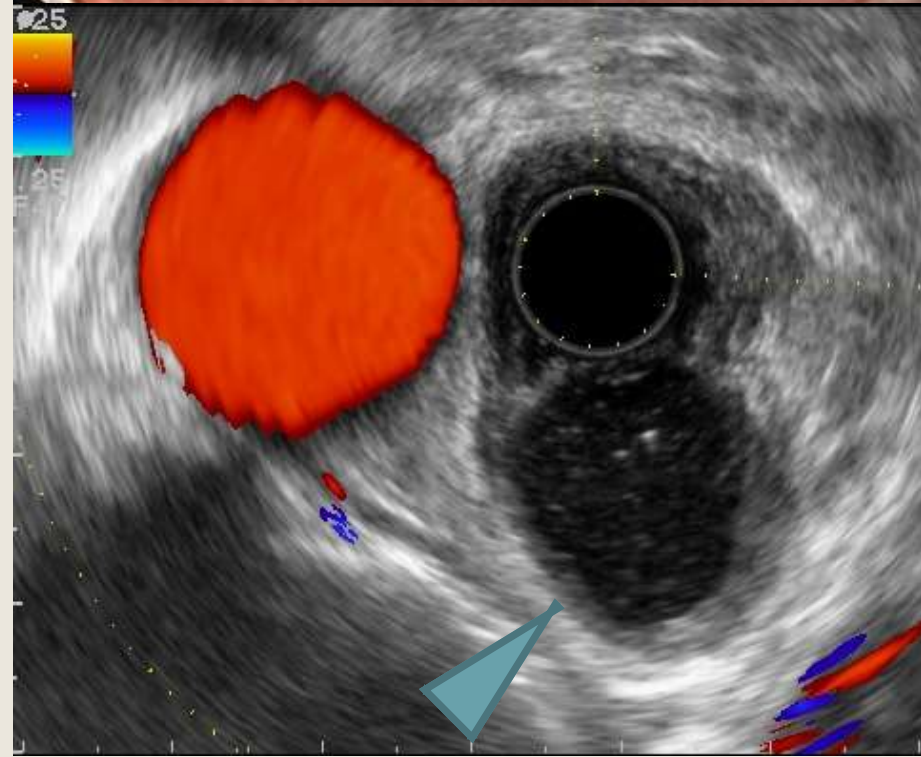
食管囊肿

- 位于粘膜下层
- 囊性无回声暗区
- 内部透声佳
- 后伴增强效应



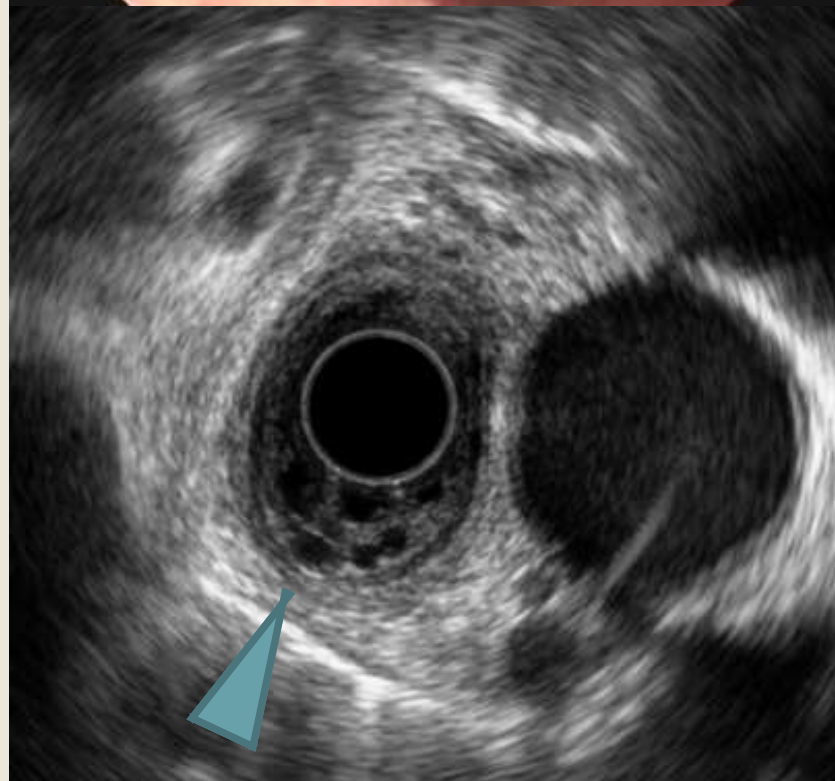
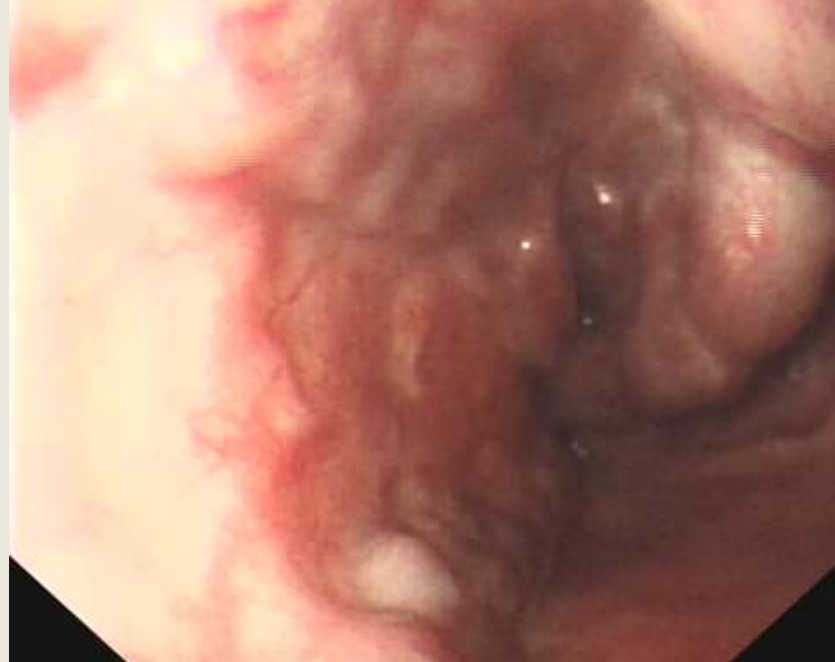
食管支气管源性囊肿

- 源于固有肌层
- 囊性低回声暗区伴点状高回声漂浮
- 后伴增强效应



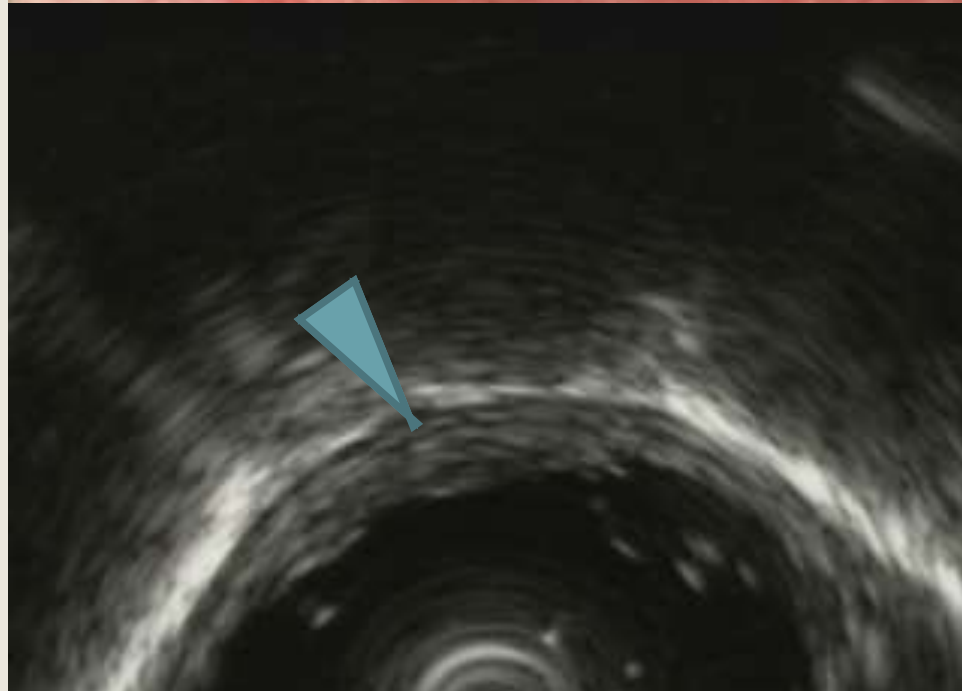
食管曲张静脉

- 位于食管壁内
- 蜂窝状或者管状无回声暗区
- 内部可见血流信号
- 硬化/组织胶治疗后管腔发生完全/不全闭塞性变化



食管早癌

- 粘膜层呈低回声增厚
- 推荐使用20MHz微探头
- 同时观察壁外淋巴结



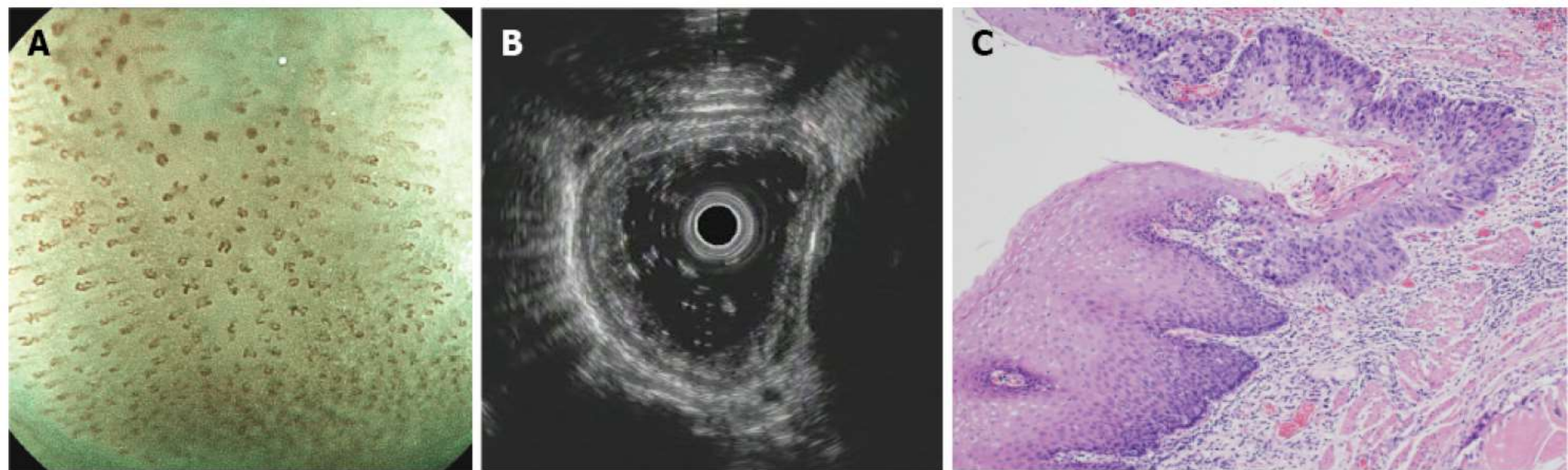
Retrospective Study

Study of preoperative diagnostic modalities in Chinese patients with superficial esophageal squamous cell carcinoma

Ya-Ting Zeng, Yu-Ying Sun, Wen-Cheng Tan, Shu-Ai Luo, Bi-Hui Zou, Guang-Yu Luo, Chun-Yu Huang

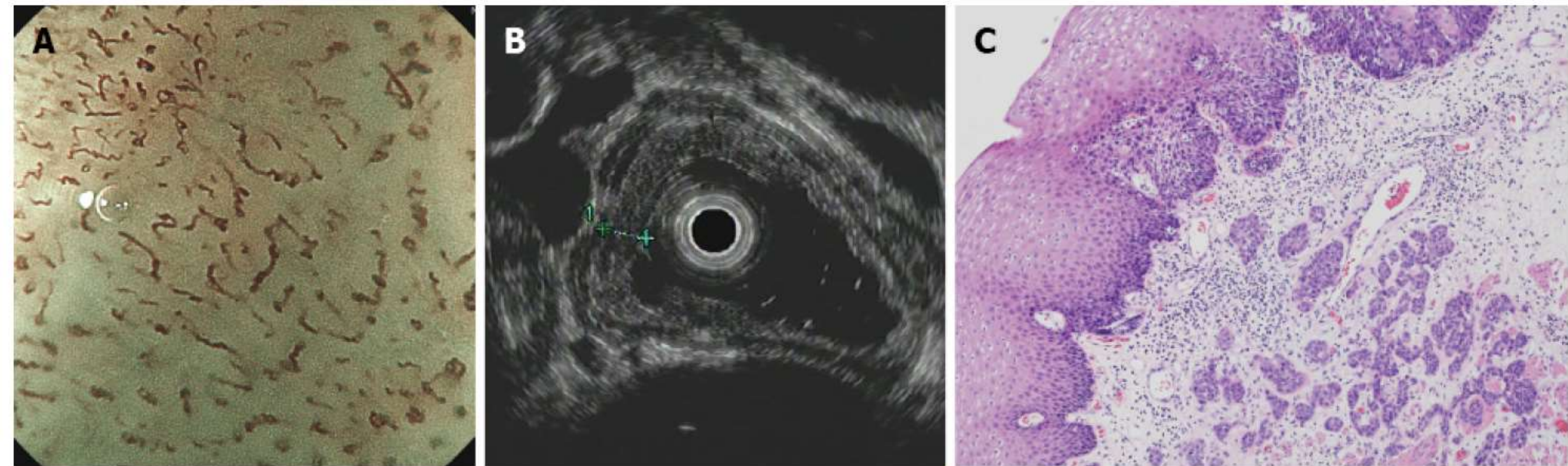
CONCLUSION

We recommend that preoperative diagnosis of SESCC be conducted based on the finding of WLI and ME-NBI/BLI. EUS can be added after patient consent in China, preferably utilizing a high-frequency miniature probe or miniature probe combined with conventional radical EUS.



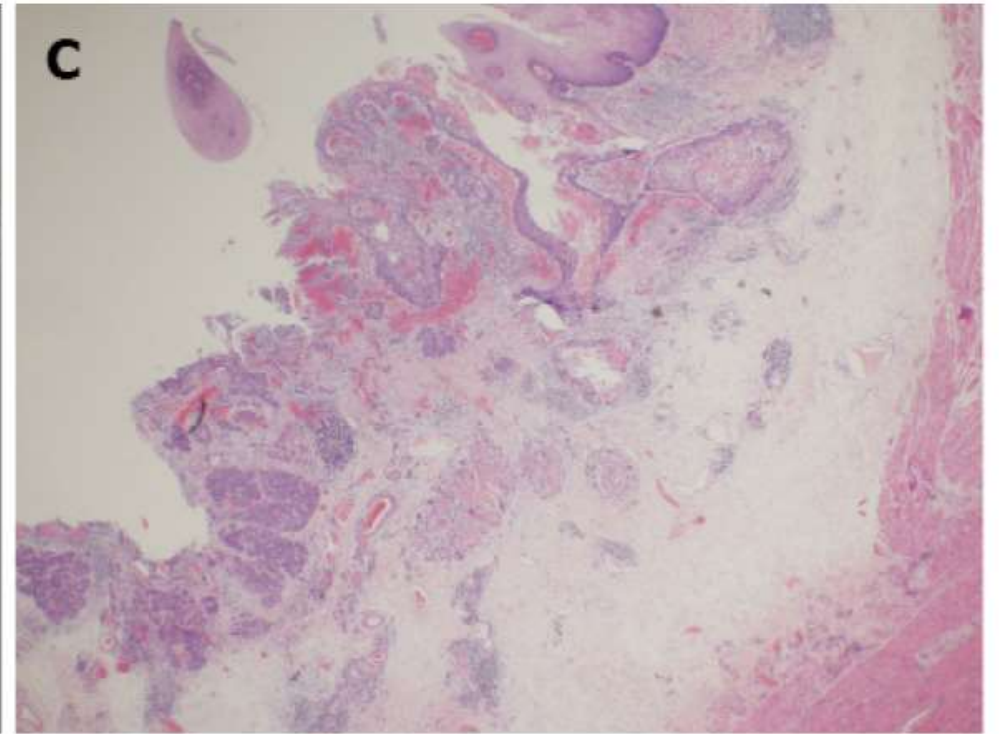
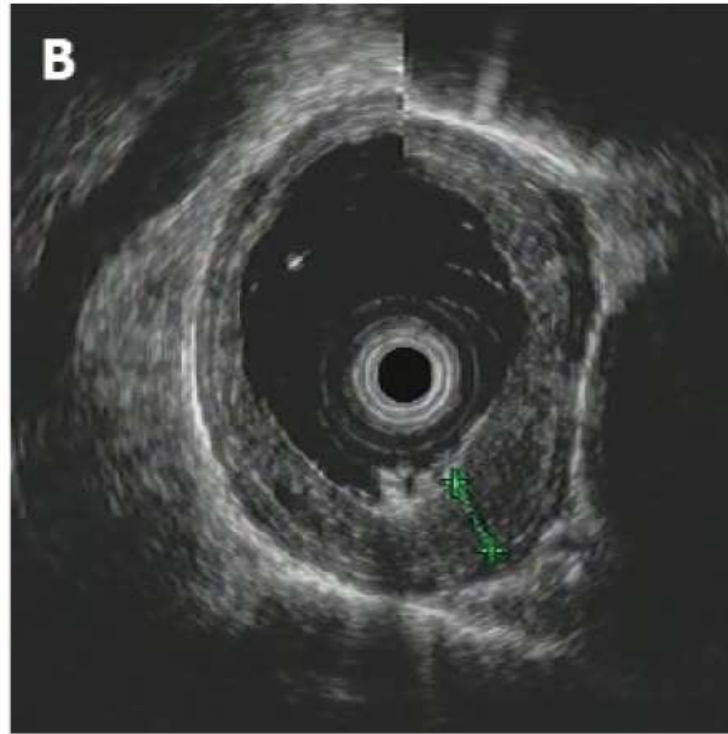
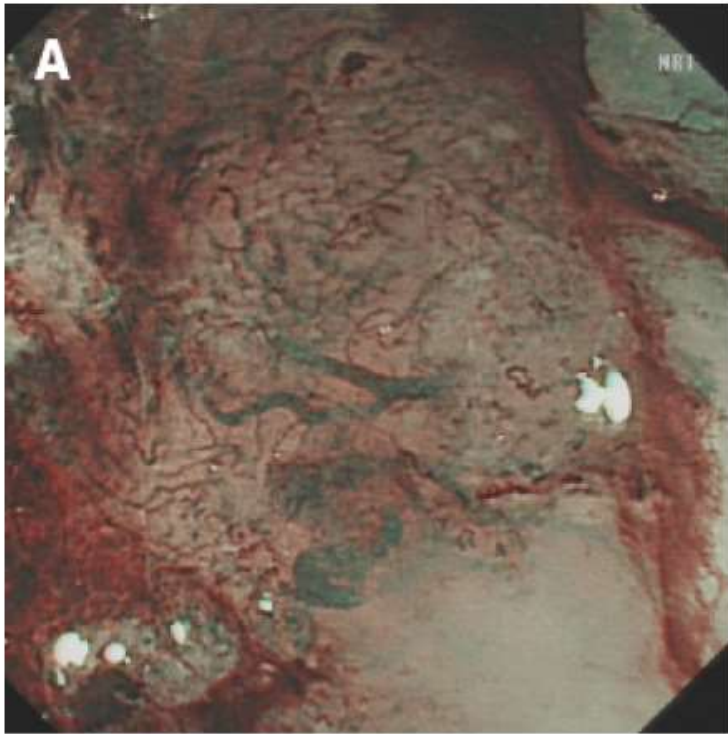
DOI: 10.4240/wjgs.v14.i9.986 Copyright ©The Author(s) 2022.

Figure 1 A typical case of carcinoma *in situ*. A: ME-BLI image shows micro-vessels with a loop-like formation (type B1); B: Ultrasonography image shows hypoechoic thickening confined to the first two layers; C: Hematoxylin-eosin staining ($\times 40$) of an endoscopic resection specimen shows that the squamous cell carcinoma is limited to the epithelium, without invasion.



DOI: 10.4240/wjgs.v14.i9.986 Copyright ©The Author(s) 2022.

Figure 2 A typical muscularis mucosal lesion. A: ME-BLI image shows type B2 vessels without loop-like formations but with a stretched and markedly elongated transformation; B: Ultrasonography image shows a hypoechoic lesion invading the third layer with continuous submucosa; C: Hematoxylin-eosin staining ($\times 40$) of a surgical specimen shows a moderately differentiated squamous cell carcinoma invading the muscularis mucosa.

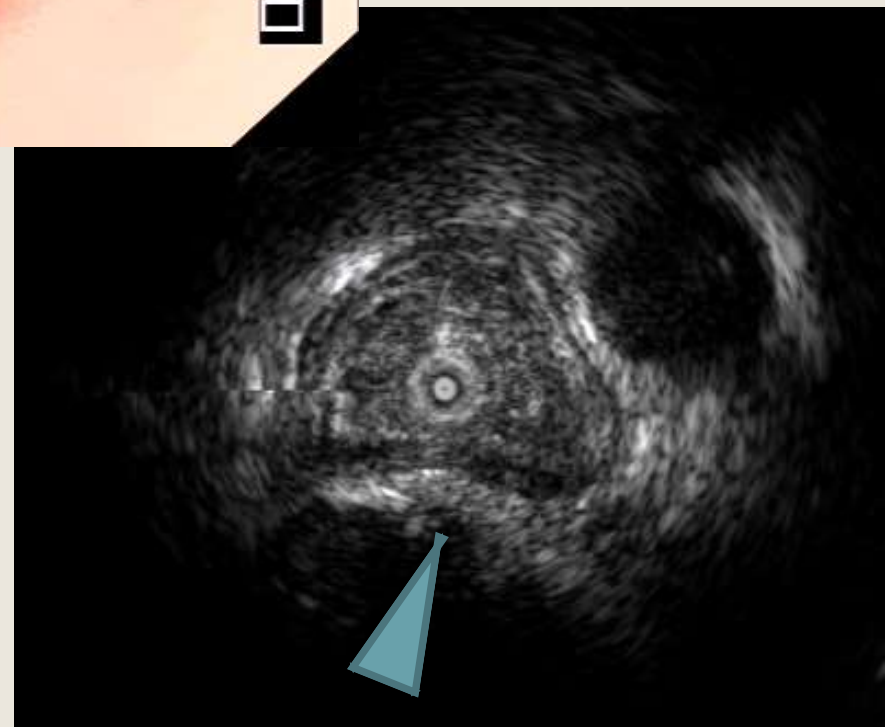
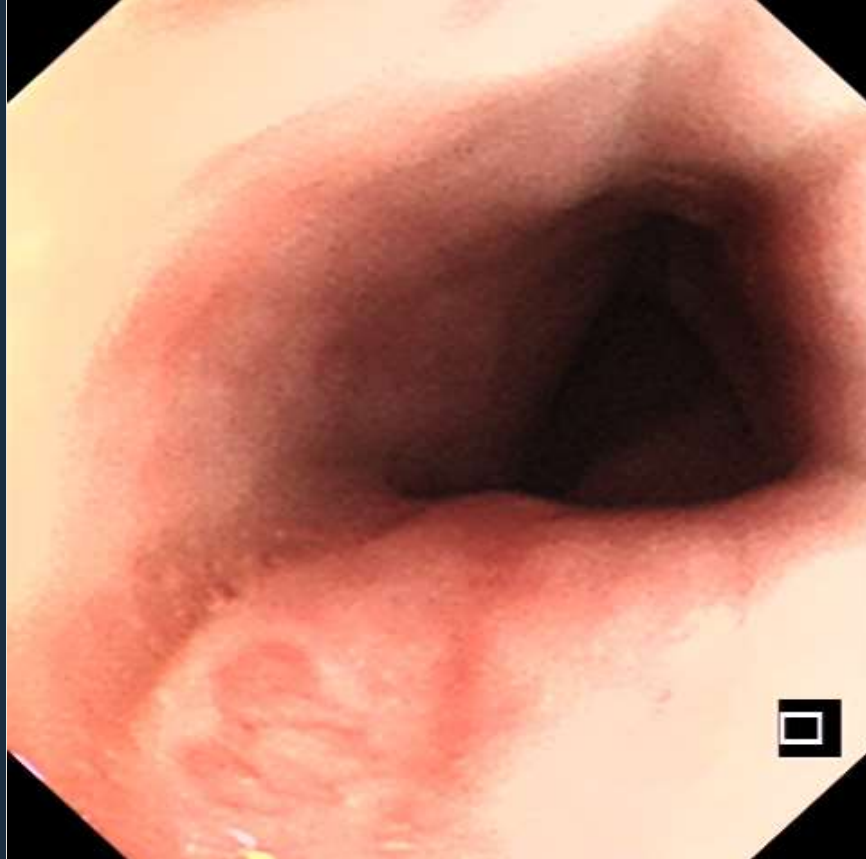


DOI: 10.4240/wjgs.v14.i9.986 Copyright ©The Author(s) 2022.

Figure 3 A typical submucosal lesion. A: ME-NBI image shows micro-vessels dilated more than three times that of B2 vessels (type B3); B: Ultrasonography image shows a hypoechoic lesion invading the fourth layer; C: Hematoxylin-eosin staining (× 20) of a surgical specimen shows a moderately differentiated squamous cell carcinoma infiltrated to the middle third of the submucosa without muscularis propria involvement.

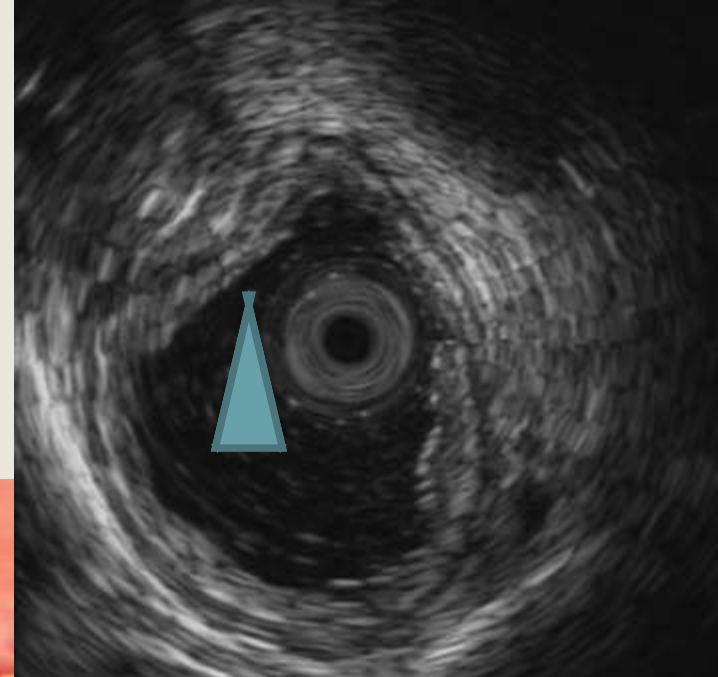
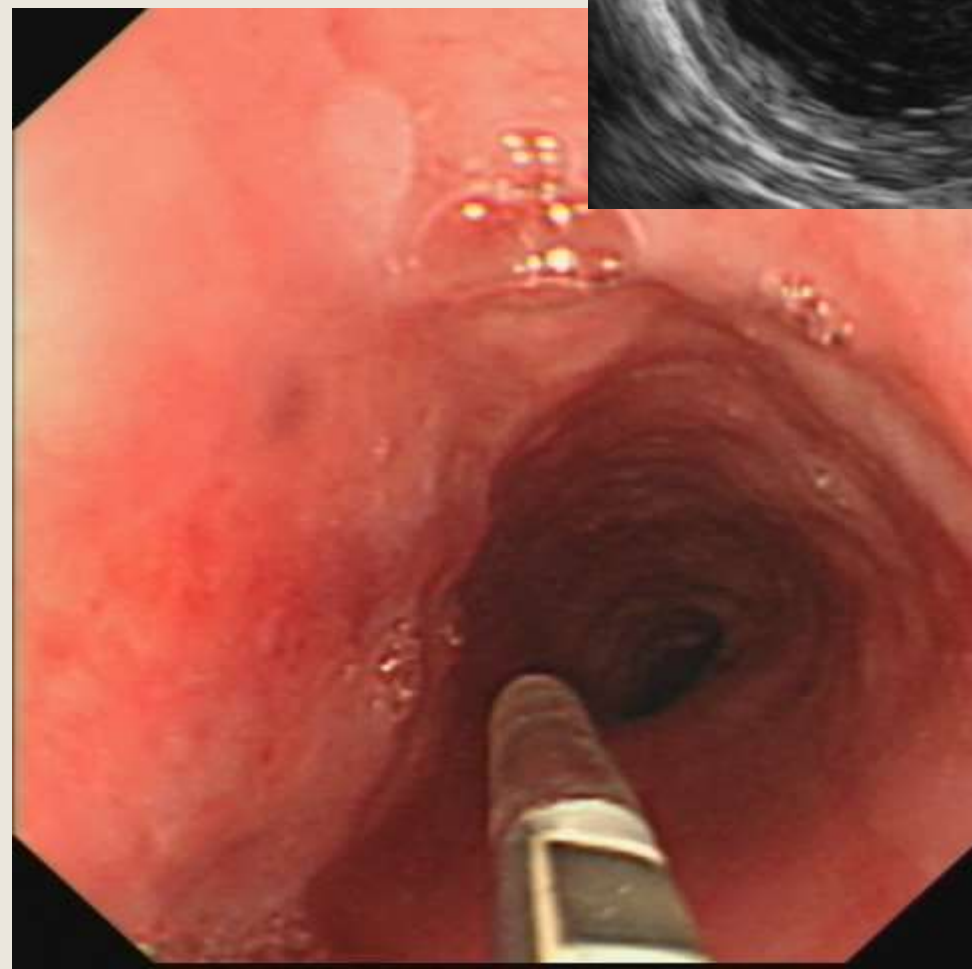
食管外压性隆起（胸椎）

- 隆起处食管壁厚度、层次结构正常
- 隆起处壁外可见弧形强回声贴压
- 弧形强回声后伴声影



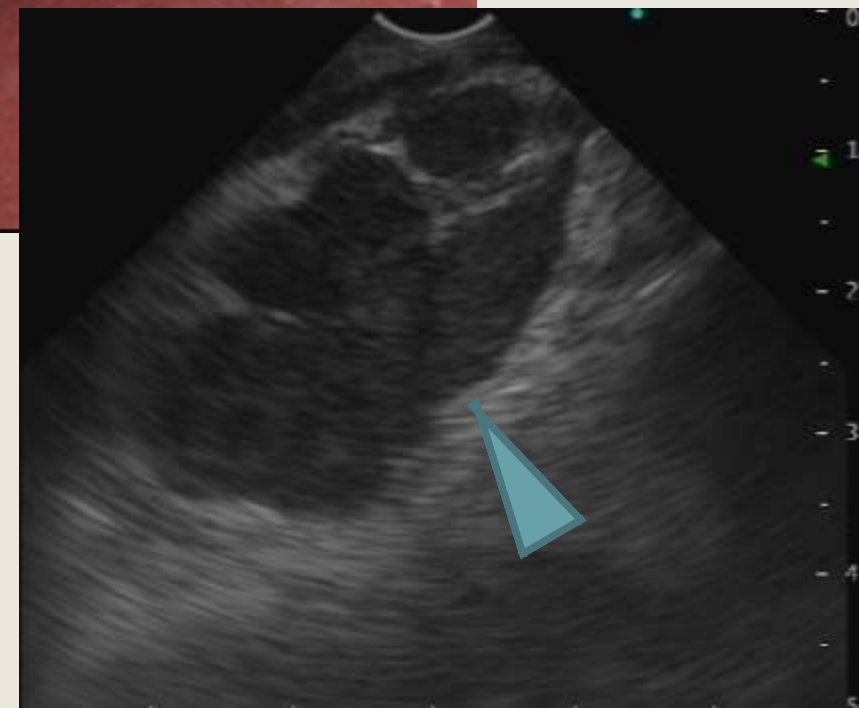
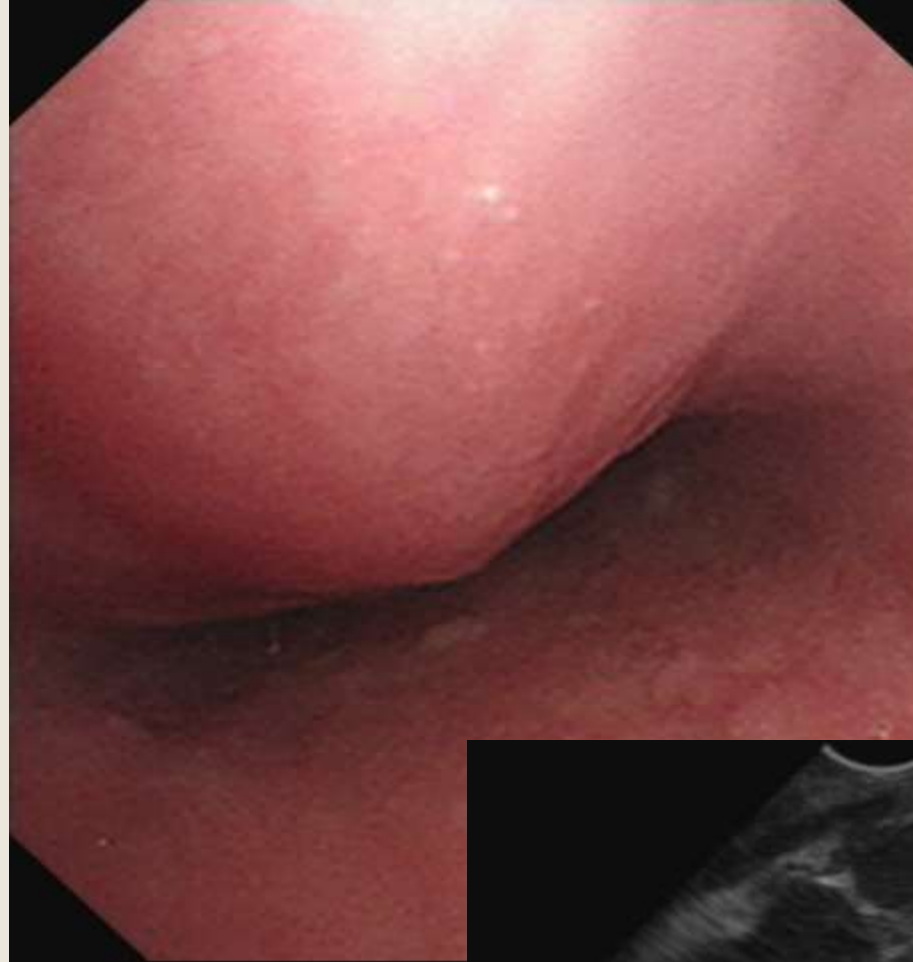
食管外压性隆起（支气管）

- 隆起处食管壁厚度、层次结构正常
- 隆起处壁外可见弧形强回声贴压
- 弧形强回声后伴多重反射（气体伪像）



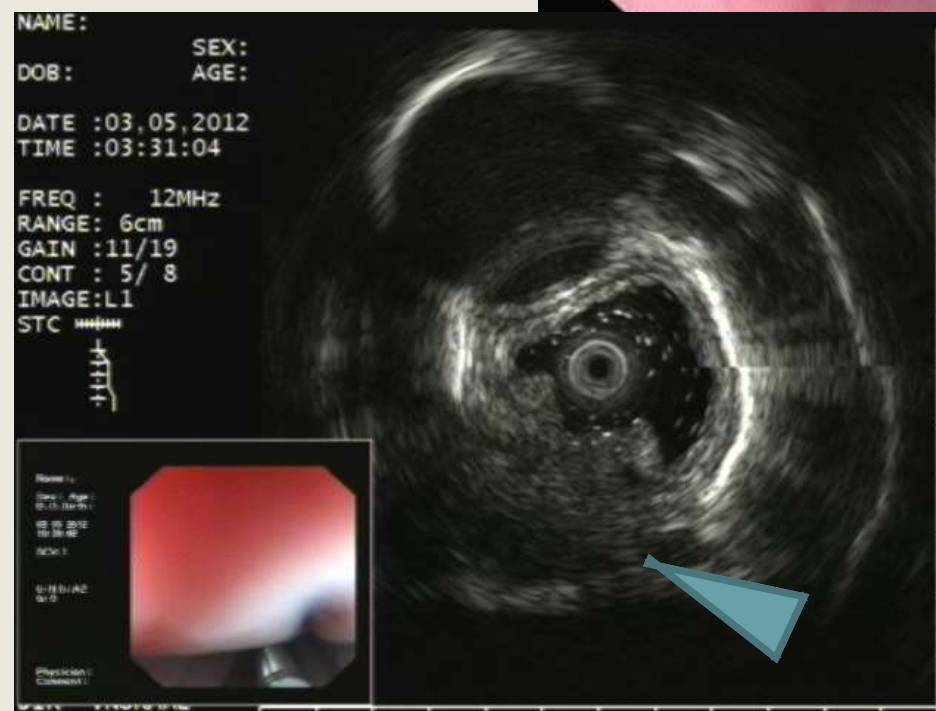
食管外压性隆起 (肿大淋巴结)

- 隆起处食管壁厚度、层次结构正常
- 隆起处壁外可见低回声病灶贴压
- 低回声病灶为相互融合的淋巴结



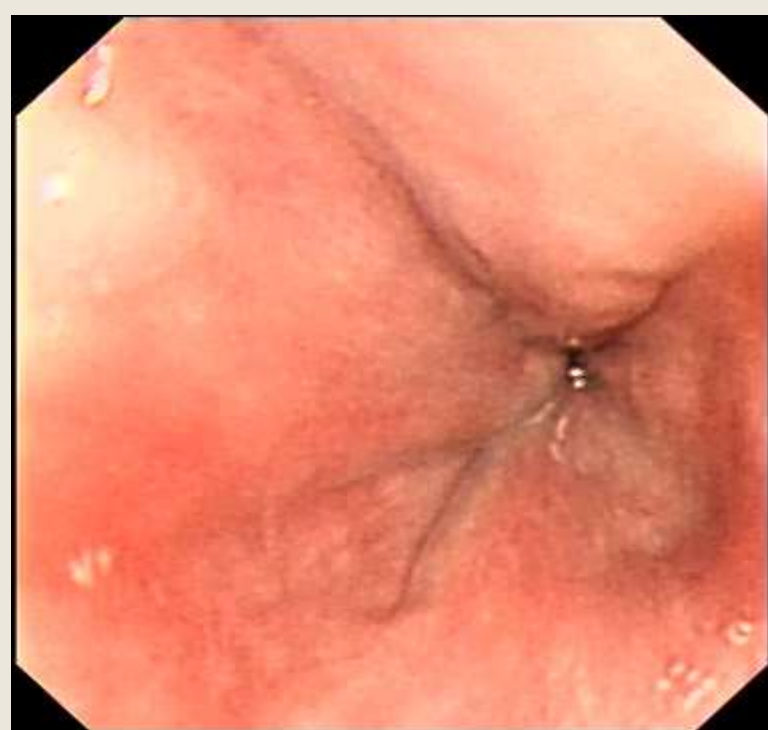
食管淋巴结结核

- 隆起处食管壁层次结构破坏
- 隆起处壁外可见低回声病灶并破入食管
- 低回声病灶与食管壁融为一体



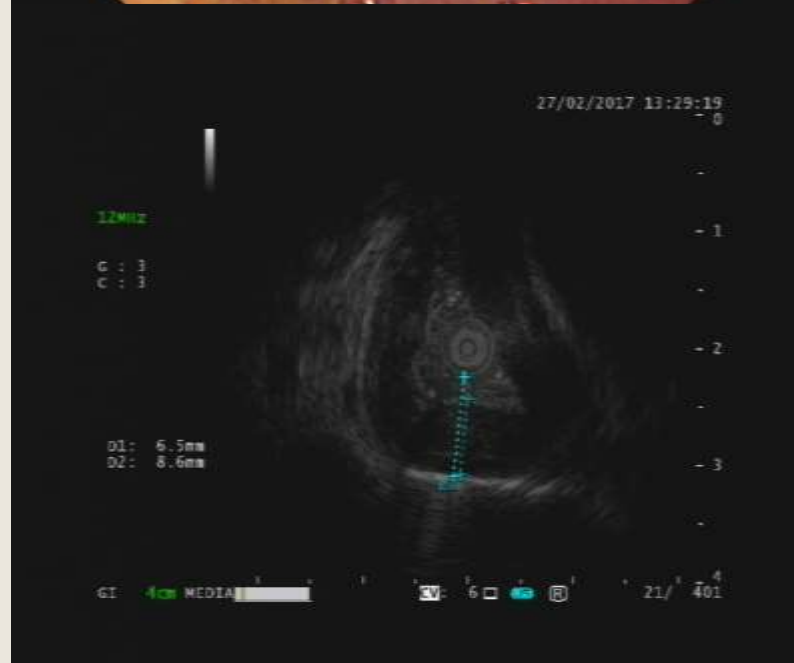
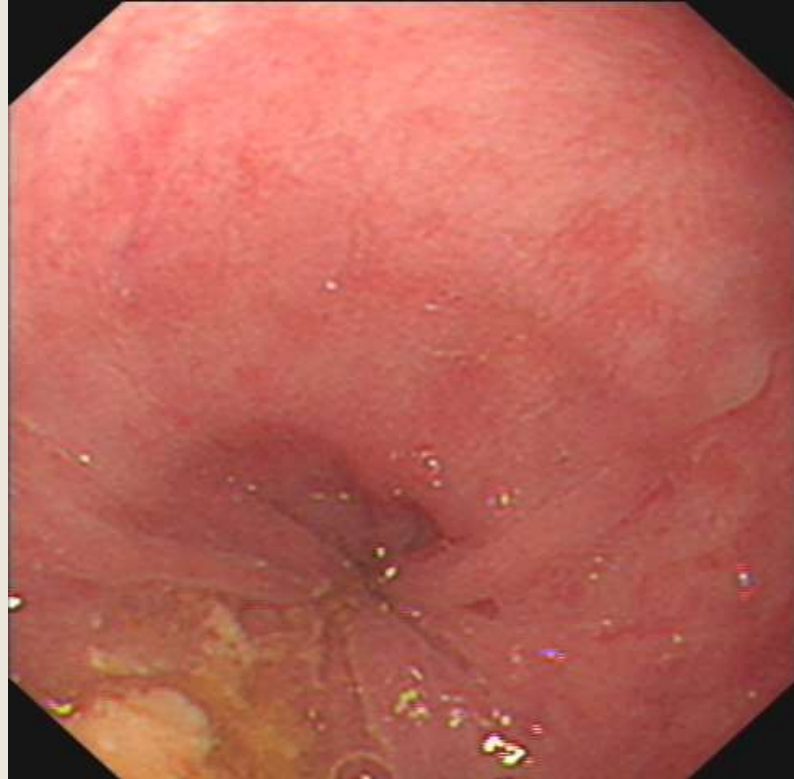
嗜酸性粒细胞性食管炎

- 食管壁弥漫性、均匀性增厚
- 食管壁层次清楚可辨
- 以固有肌层增厚为主
- 固有肌层回声增高，呈中等回声



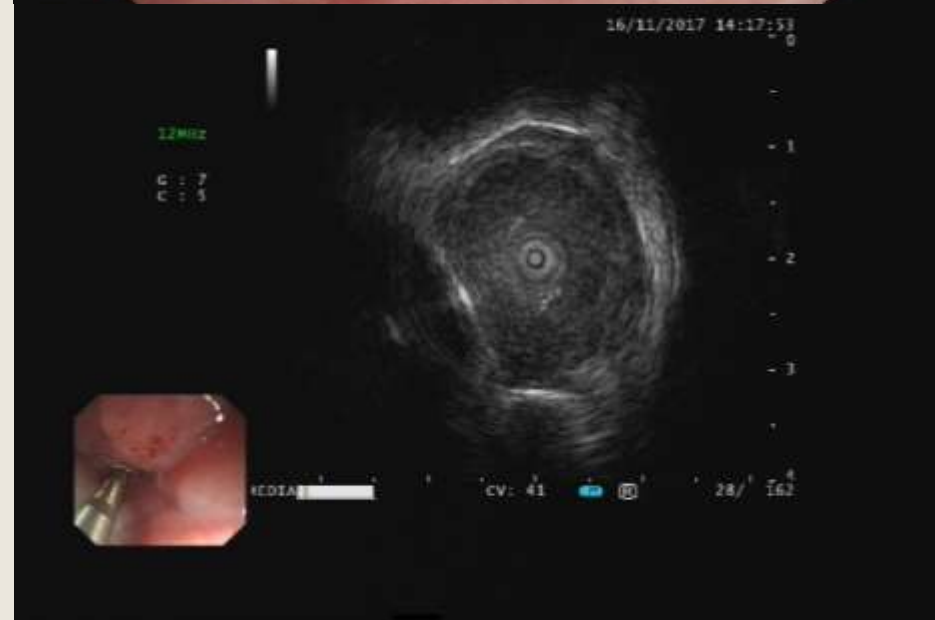
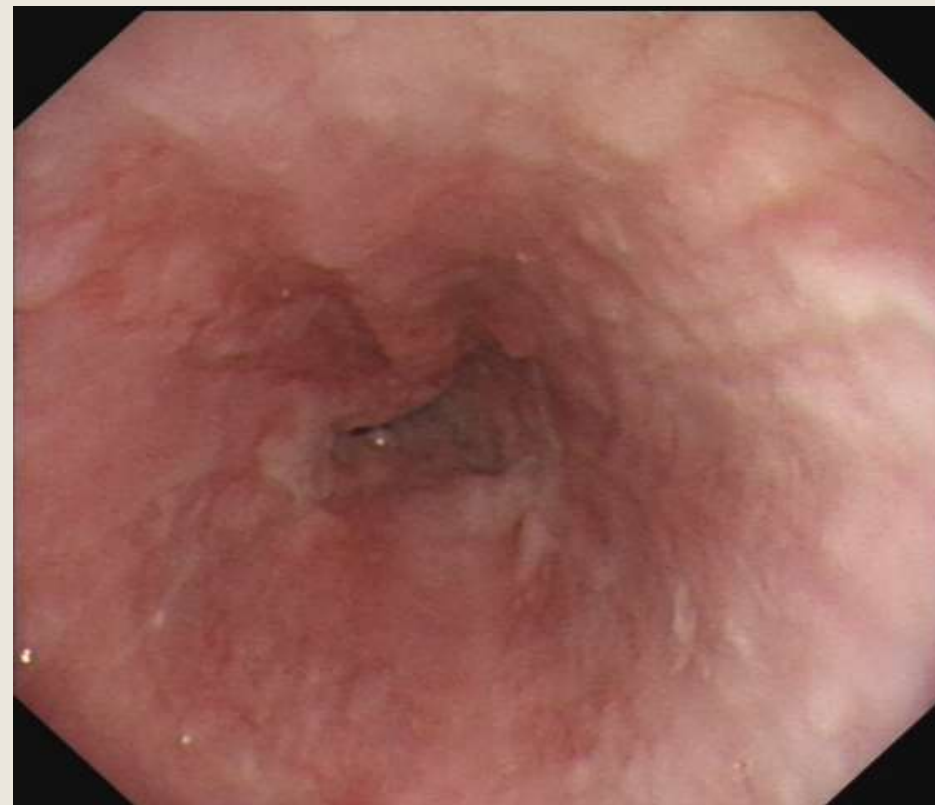
贲门失弛缓症

- 食管壁弥漫性、均匀性增厚
- 食管壁层次结构存在
- 以固有肌层增厚为主
- 固有肌层回声欠均匀



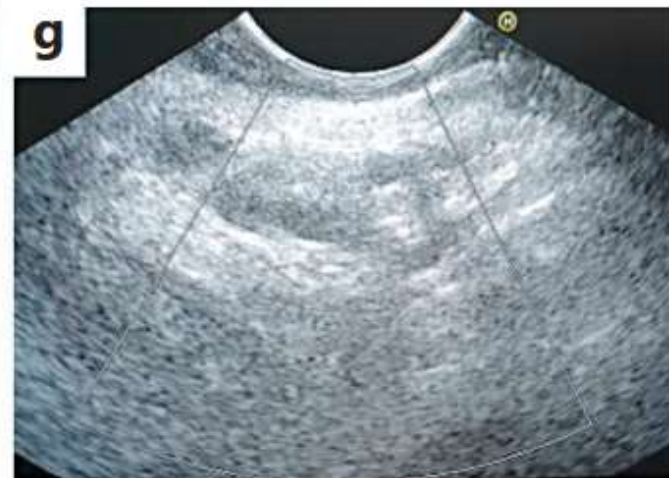
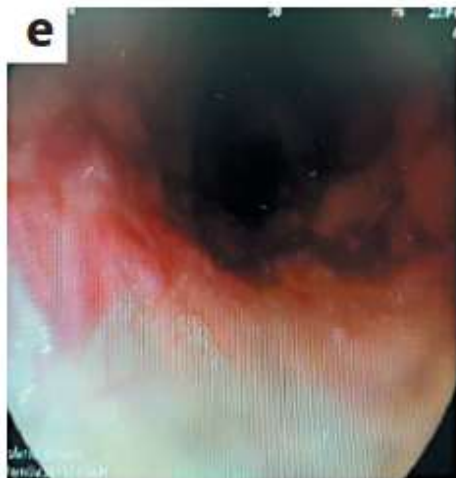
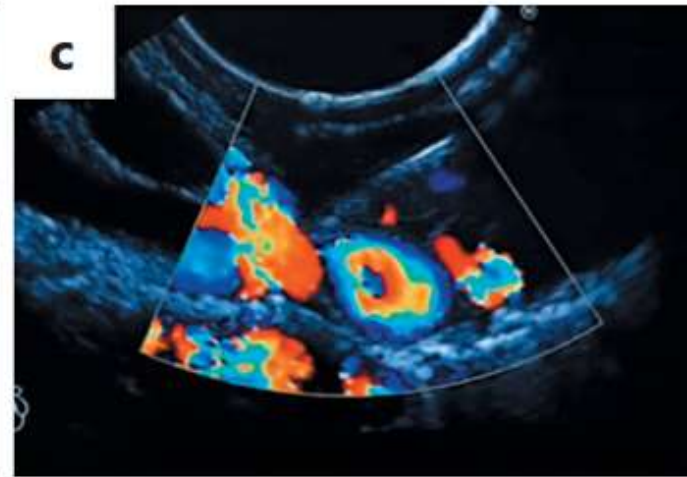
环周缩窄型食管癌

- 食管壁弥漫性、均匀性增厚
- 食管壁呈中-低回声改变
- 食管壁层次不清、结构消失



The Clinical Role of Endoscopic Ultrasound for Management of Bleeding Esophageal Varices in Liver Cirrhosis

Case Rep Gastroenterol 2022;16:295–300



胃疾病超声内镜检查

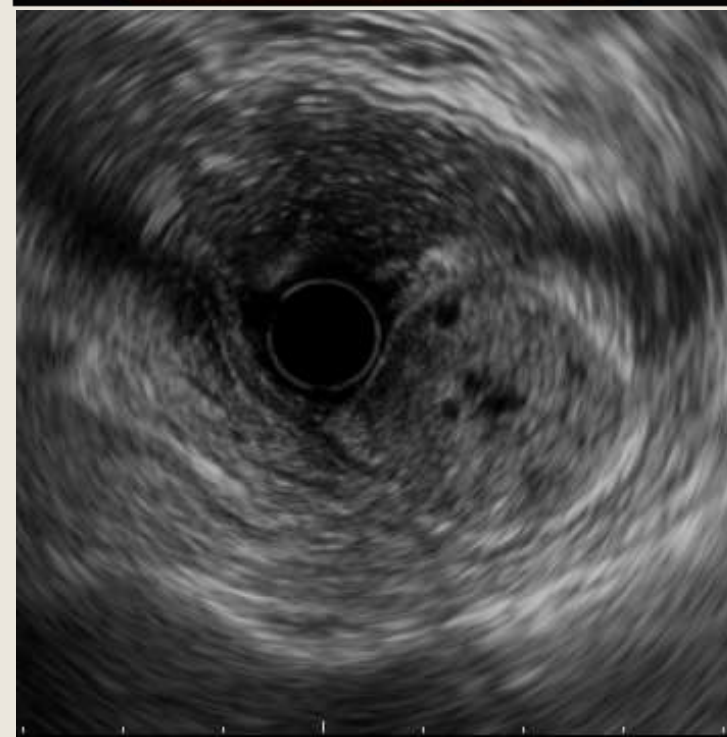
胃粘膜下病变

- 种类繁多
- 声像图类似
- 异病同图
- 鉴别困难
- 性质不同
- 预后不同

- GIST
- 平滑肌瘤
- 神经鞘瘤
- 神经内分泌肿瘤
- 异位胰腺
- 脂肪瘤
- 钙化性纤维瘤
- 炎性纤维性息肉
- 异物肉芽肿
- 深在性囊性胃炎
- 血管球瘤
- 血管瘤
- 转移瘤
- 囊肿
- 孤立性曲张静脉
- ○ ○ ○ ○ ○ ○

胃 GIST

- 源于固有肌层或粘膜下层
- 圆形或椭圆形低回声
- 内部回声均匀或不均匀



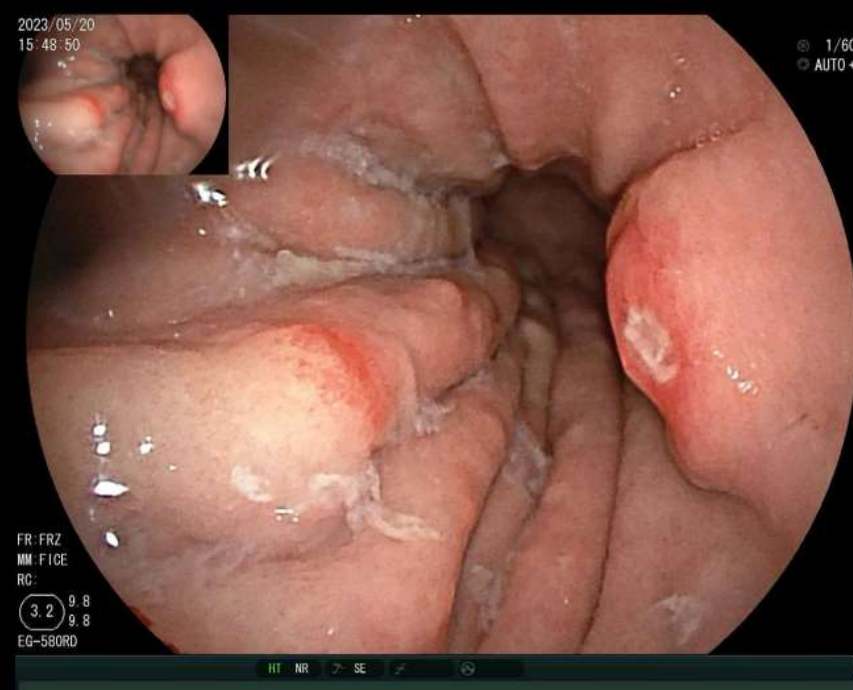
胃异位胰腺

- 多层次累及（粘膜下层为主，可同时浸润粘膜层及固有肌层）
- 低回声，均匀或不均匀
- 内部可有管腔样结构



胃神经内分泌 肿瘤

- 单发或多发
- 起源于粘膜深层（可累及粘膜下层、固有肌层）
- 中-低回声，大致均匀
- 内部血供丰富



2023/05/20
15:45:16



胃粘膜下病变的EUS-FNA

- EUS-FNA对粘膜下病变的活检取材成功率与病理确诊率均不够理想。
- 在一项前瞻性多中心临床研究中，应用19G的粗针对46例胃粘膜下病变行EUS-FNA，综合细胞学、组织学及免疫组化结果，仅有24例（52.2%）获得了明确的病理诊断，3例（6.5%）的病理结果不够明确，19例（41.3%）毫无诊断结果。



A combined radiomic model distinguishing GISTs from leiomyomas and schwannomas in the stomach based on endoscopic ultrasonography images



FIGURE 2 ROI segmentation for radiomic analysis: (a) original EUS image; (b) segmentation of tumor region; and (c) segmentation of tumor region and muscularis propria region (arrow). EUS, endoscopic ultrasonography; ROI, region of interest.

A combined radiomic model distinguishing GISTs from leiomyomas and schwannomas in the stomach based on endoscopic ultrasonography images

Xian-Da Zhang¹  | Ling Zhang¹ | Ting-Ting Gong¹ | Zhuo-Ran Wang² | Kang-Li Guo³ | Jun Li⁴ | Yuan Chen⁵ | Jian-Tao Zhang⁶ | Ben-Gong Ye⁶ | Jin Ding⁵ | Jian-Wei Zhu³ | Feng Liu⁴ | Duan-Min Hu³ | JianGang Chen² | Chun-Hua Zhou¹  | Duo-Wu Zou¹ 

TABLE 2 Selected radiomic features for the conventional radiomic model and combined radiomic model.

Model	Selected radiomic features	Numbers
Conventional radiomic model	Gray-level emphasis, gray-level run emphasis, contrast, skewness, kurtosis, mean	6
Combined radiomic model	GLCM_IMC1, gray-level emphasis, GLCM_MCC, energy, skewness, strength, kurtosis, busyness	8

Abbreviations: GLCM, gray-level co-occurrence matrix; IMC, informational measure of correlation; MCC, maximal correlation coefficient.

TABLE 3 Diagnostic performance of the conventional radiomic model and combined radiomic model in the testing dataset.

Model	Sensitivity (%)	Specificity (%)	PPV (%)	NPV (%)	Accuracy (%)	AUC (95% CI)
Conventional radiomic model	74.4	81.0	87.5	63.9	76.8	0.830 (0.801–0.862)
Combined radiomic model	91.0***	90.6***	94.6	84.9	90.9	0.953 (0.933–0.976)

Sensitivity and specificity of the conventional radiomic model and combined radiomic model were compared.

Abbreviations: AUC, area under the curve; NPV, negative predictive value; PPV, positive predictive value.

*** $p < 0.001$.

胃壁弥漫性增厚 (皮革胃/淋巴瘤)

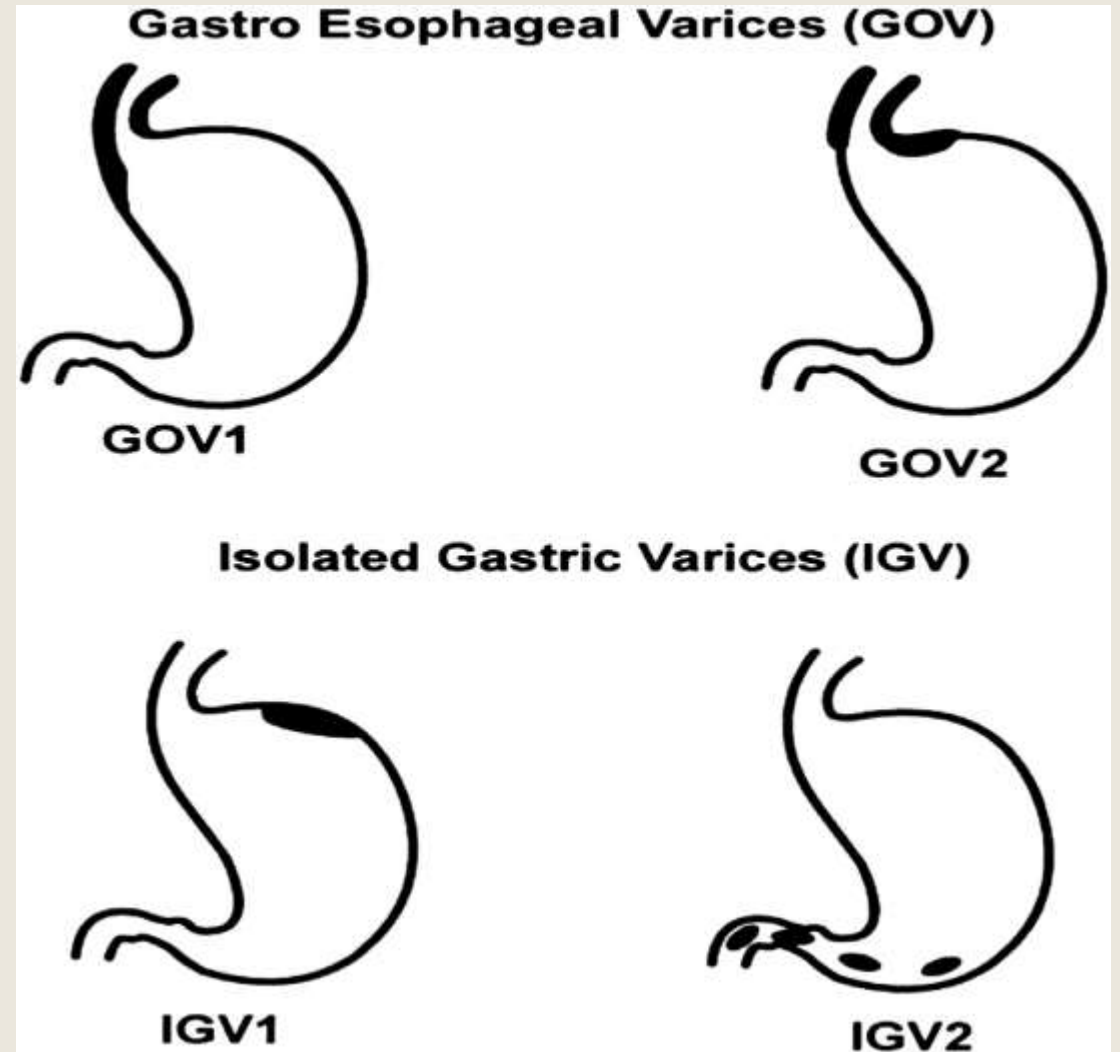
- EUS-FNA诊断准确率60%
- 常规活检失败者推荐深挖活检



胃静脉曲张

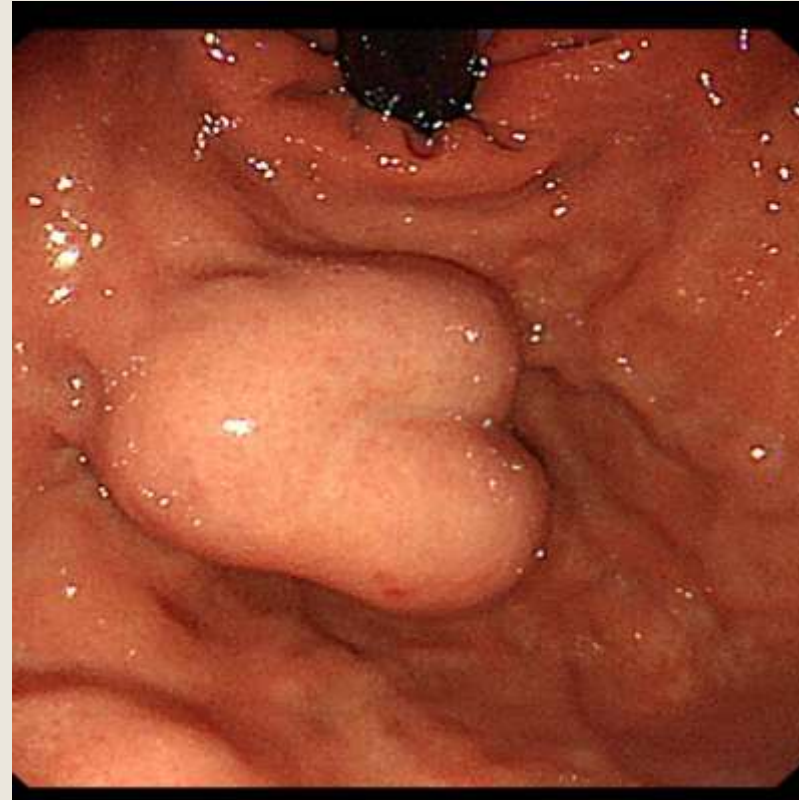
Sarin Classification

- GVs are categorized into 4 types based on the relationship with EV, as well as by their location in the stomach
- Gastroesophageal Varices (GOV) type 1, and GOV type 2;
- isolated gastric varix (IGV) type 1, and IGV type 2.



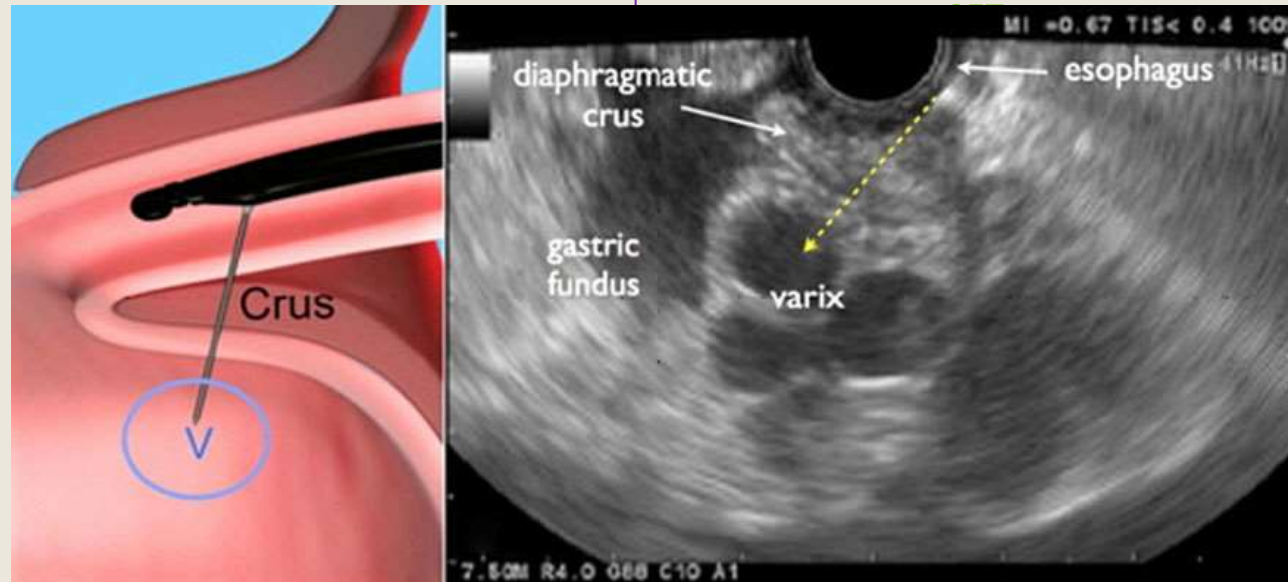
IGV1

- GOV type 1 is the most common type. But, **the incidence of bleeding is highest with IGV type 1** followed by GOV type 2.
- And **the venous drainage of IGV1 is different** from GOV type1 and GOV type 2.



EUS-guided Access for IGV1

Gastrointest. Endosc. 2013; 77: 846–



The coils can be placed into varices via EUS guided approach. IGV1 is usually in the gastric fundus, so the puncture needle would traverse the angle of His in order to reach the target from the lower esophagus.

Structure of Coil

Glue *immediately* adheres to the coil fibers when a coil is immersed into blood of varix.



[Surgical Endoscopy](#), 2016,
Volume 30, 1396–1404

EUS下弹簧圈置入联合组织胶注射术治疗胃肾分流型巨大胃底曲张静脉 (Case 1)

胃底巨大曲张静脉团



EUS介入治疗后半年



EUS下弹簧圈置入联合组织胶注射术治疗胃肾分流型巨大胃底曲张静脉 (Case 2)

胃底巨大曲张静脉

术后排胶溃疡形成

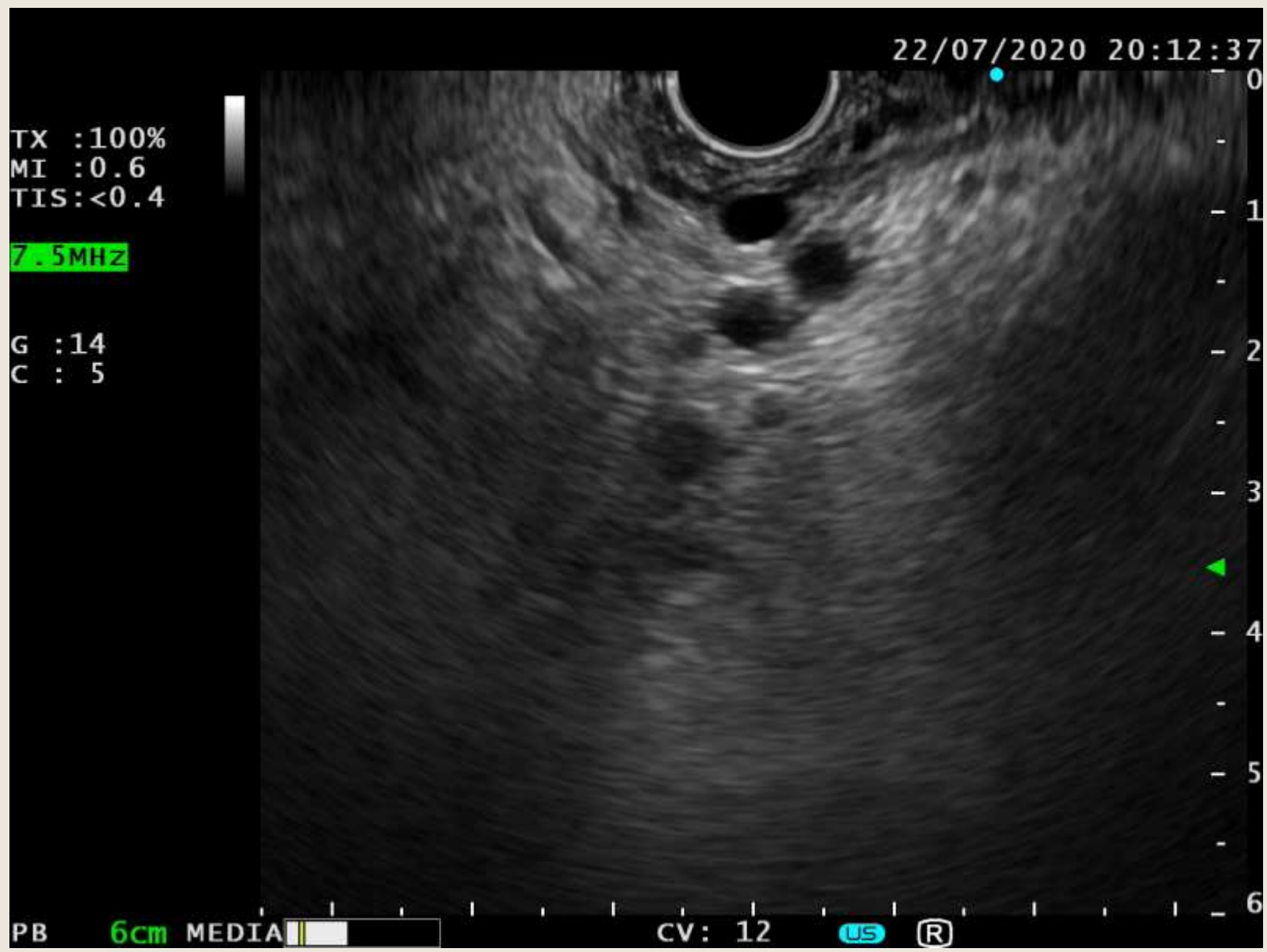
弹簧圈胶块排出



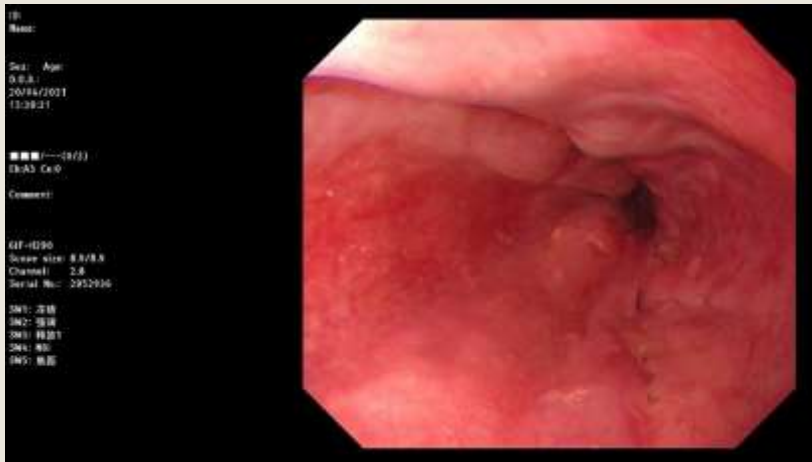
EUS-SVD

- EUS引导下食管胃曲张静脉精准断流术（EUS guided- Selective Varices Devascularization, **EUS-SVD**）是在EUS的实时引导下，对食管、胃或异位曲张静脉从来源血管方向进行精准穿刺，注入硬化剂、组织胶和/或置入弹簧圈使曲张静脉管腔闭塞、血流阻断的内镜下治疗新技术。
- **EUS-SVD**与常规EVO相比具有操作更加直观、高效、安全与经济等优势。

EUS-SVD



GOV行EUS-SVD术后



十二指肠隆起性病变超声内镜检查

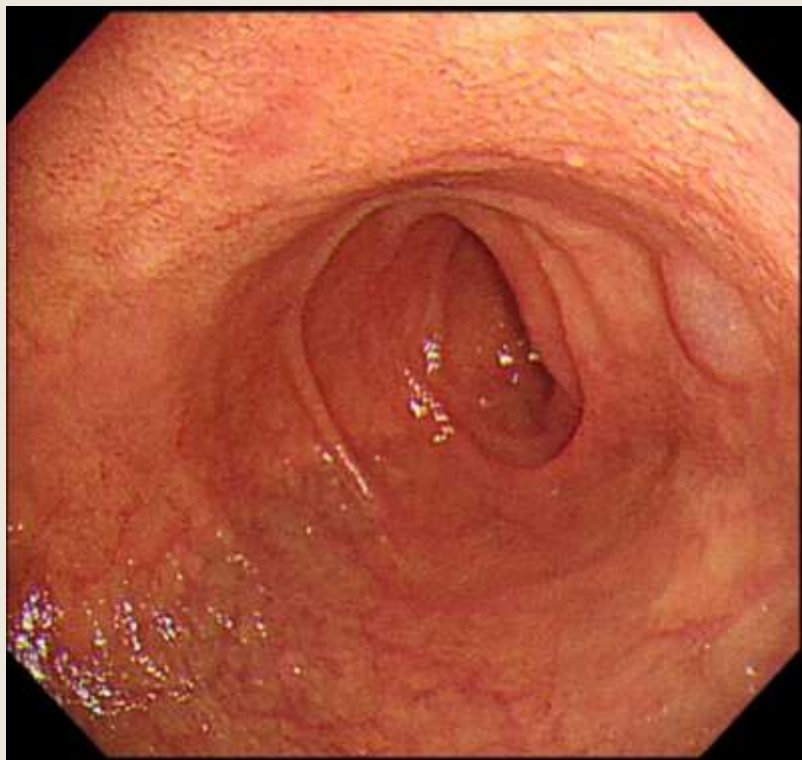
肿物回声	肿物类型	来源层次	EUS特征
无回声	Brunner腺囊肿	第3层（黏膜下层）	后壁增强效应
	曲张静脉	第3层（黏膜下层）	可追踪的血管结构，多普勒显示有血流
	淋巴管瘤	第3层（黏膜下层）	常为多房性，无血流，压之易变形
	海绵状血管瘤	第3层（黏膜下层）	多囊性，多普勒显示可有血流

肿物回声	肿物类型	来源层次	EUS特征
低回声	间质瘤	第4层	边界清，回声均匀
	神经内分泌肿瘤	第2层，可累及第3层	内部结构呈“胡椒-盐”形态，边界光滑，内部血流丰富
	神经鞘瘤	第4层	边界清，回声均匀
	转移灶	任一层次	
	淋巴瘤	第2、3层，可侵及第4层	无明显边界

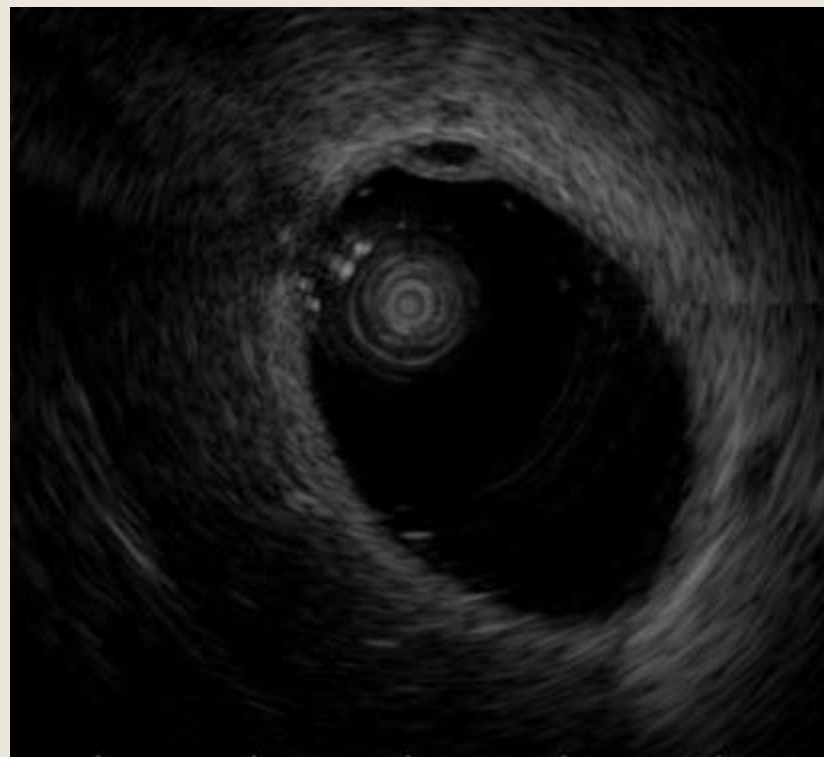
肿物回声	肿物类型	来源层次	EUS特征
高回声	脂肪瘤	第3层（黏膜下层）	回声均匀，后方有声衰减
	Brunner腺瘤	第2+3层	有明显边界，回声均匀

肿物回声	肿物类型	来源层次	EUS特征
混杂回声	异位胰腺	第3层（黏膜下层），有时深达固有肌层	回声不均匀，可见腺管样结构，内有时胰液潴留形成囊样扩张
	Brunner囊腺瘤	第2+3层	有明显边界，回声均匀，内可有囊状结构

囊肿



球部后壁粘膜下隆起，半透明囊性感

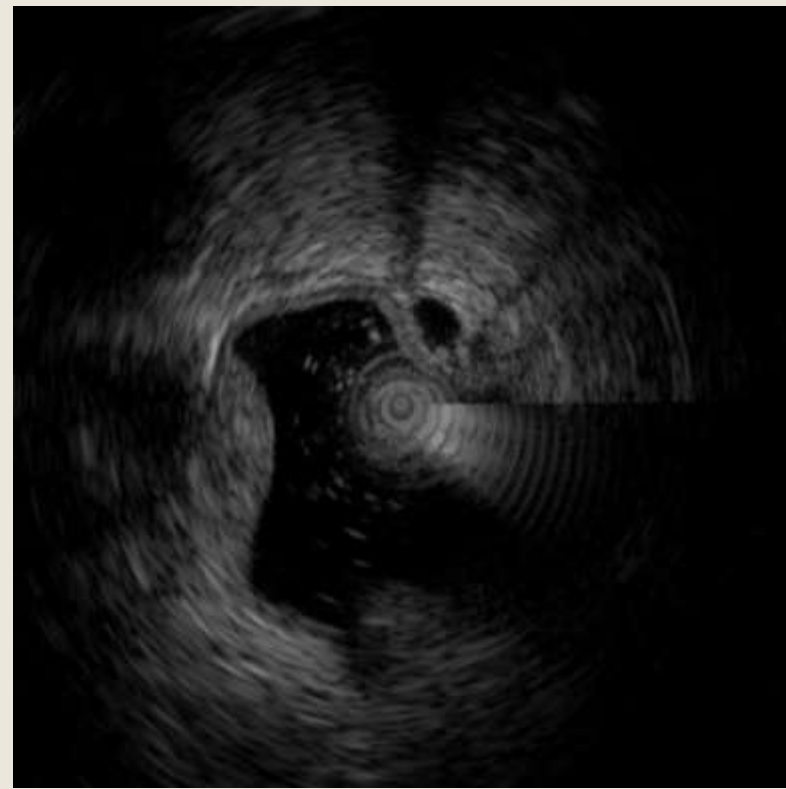


粘膜下层无回声，边界清楚

囊肿



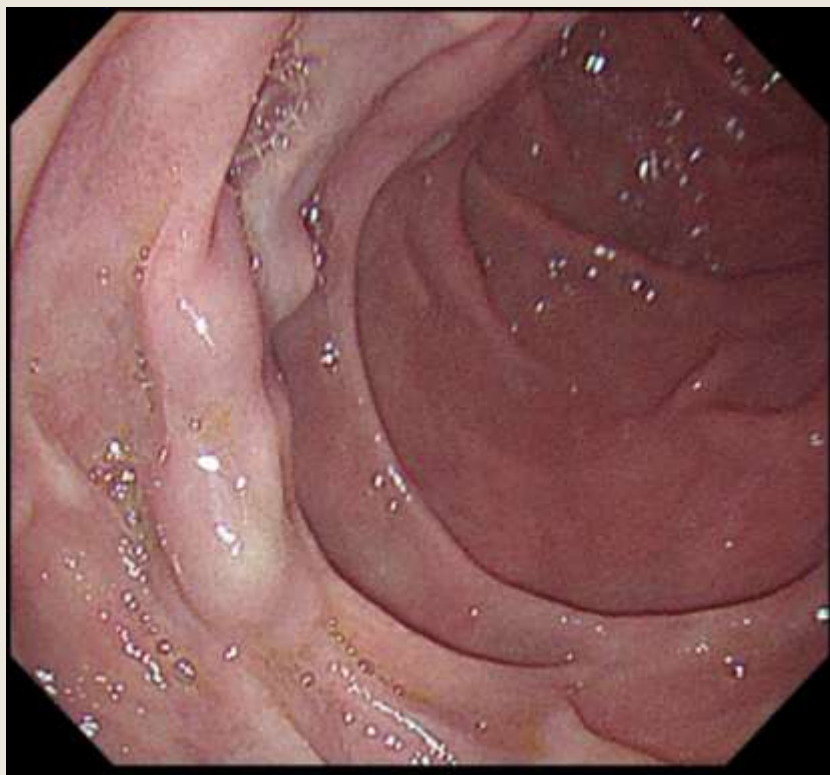
降部乳头对侧粘膜下隆起，表面光滑



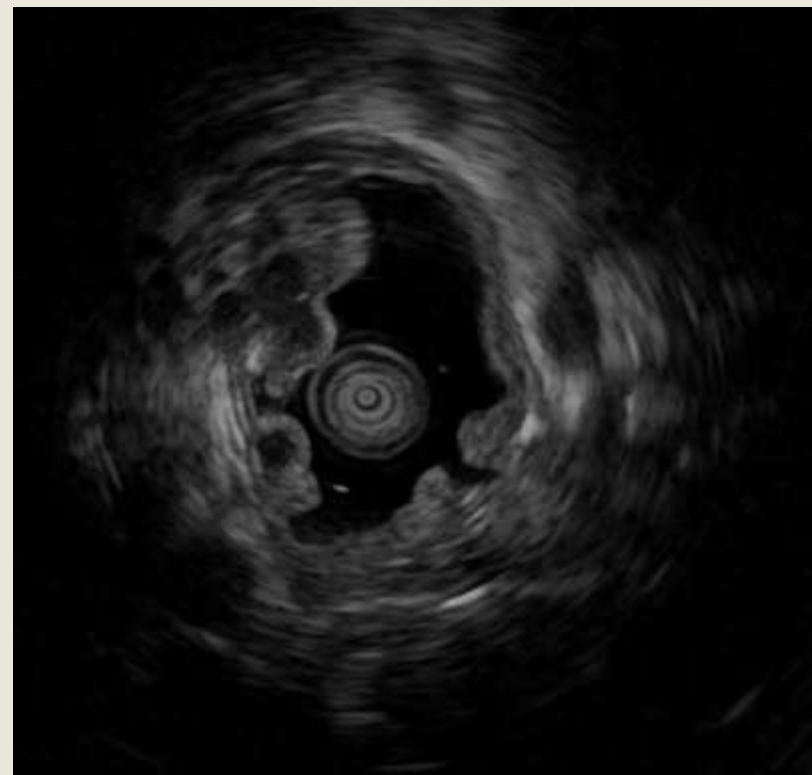
黏膜下层无回声，后方可见增强效应，边界清



曲张静脉



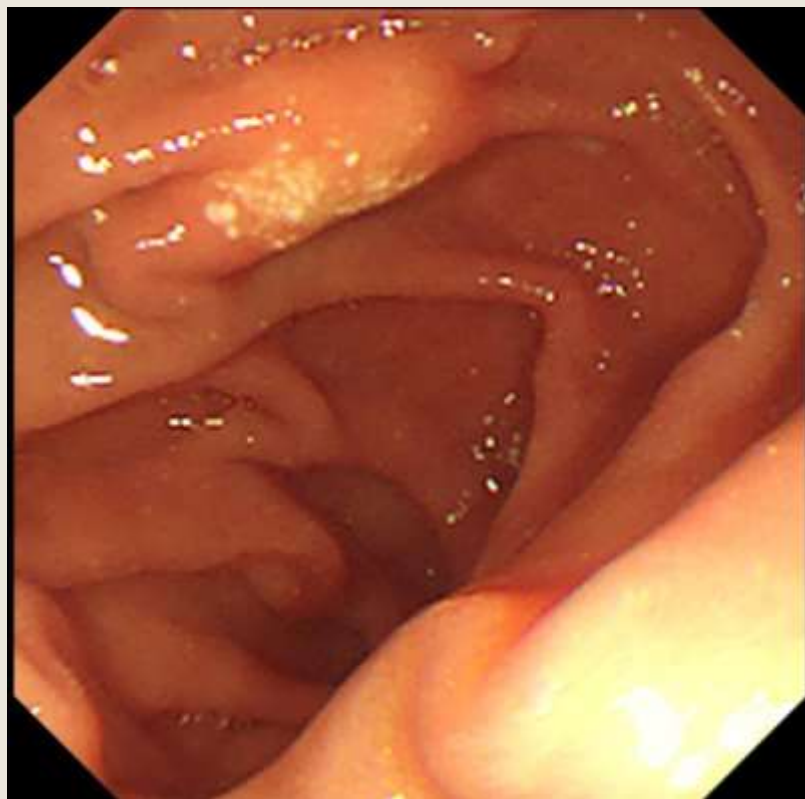
十二指肠降部乳头旁后壁葫芦状粘膜下隆起，表面光整



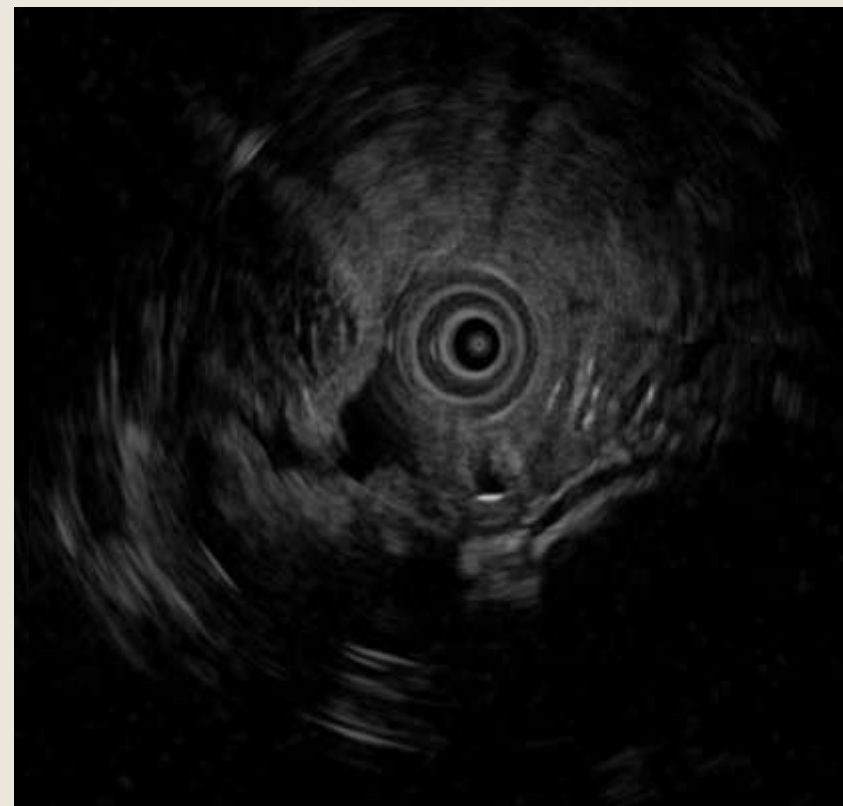
粘膜下层无回声管腔结构，部分迂曲呈团



淋巴管扩张



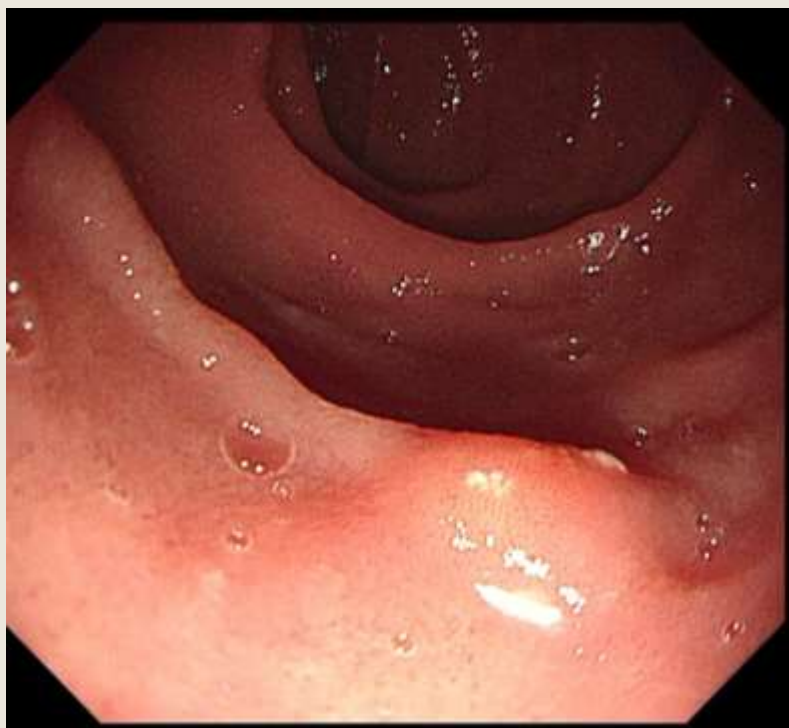
降部粘膜下隆起，表面可见白点



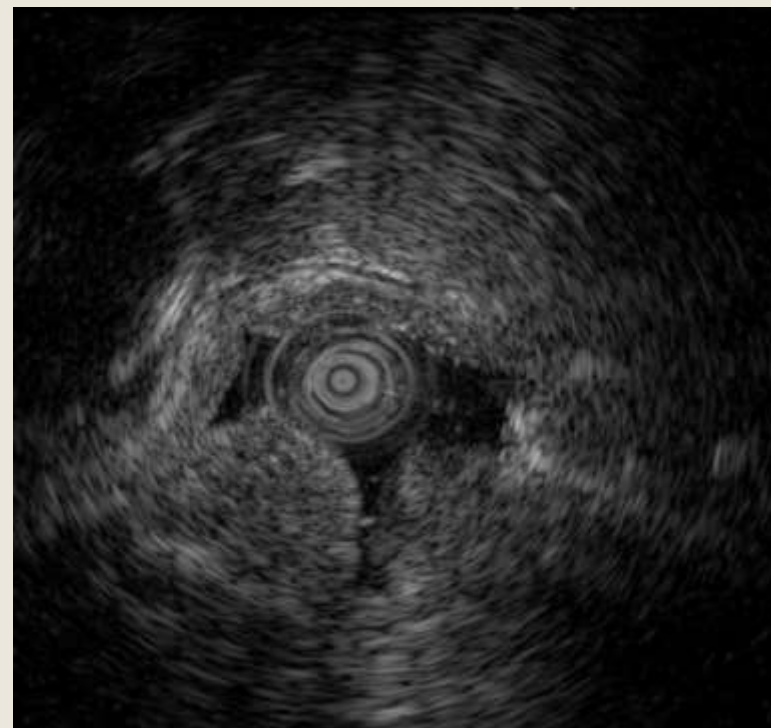
粘膜下层的低回声，内部可见管状结构



淋巴管扩张



降部粘膜下隆起，表面可见白斑



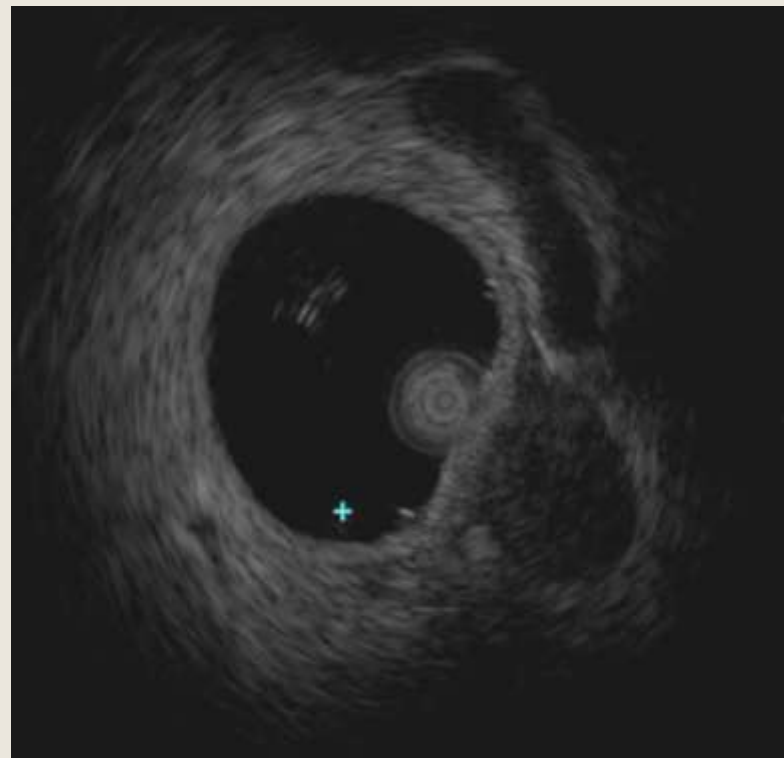
膜下层中低等回声，内部呈蜂窝状



间质瘤

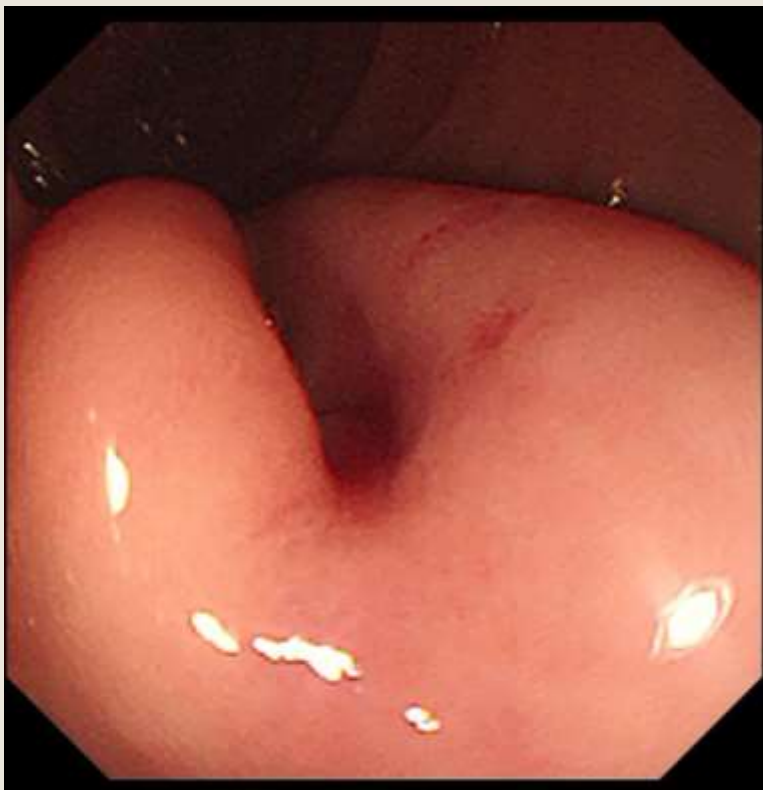


球部大弯侧隆起性病变，表面光整

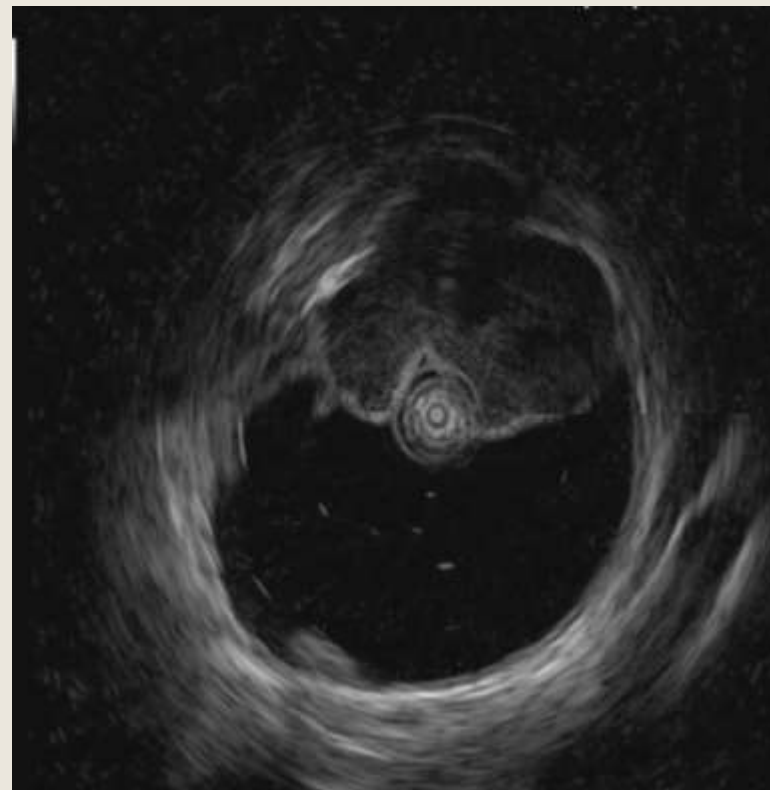


起源于固有肌层的低回声团块，内部回声欠均匀，边界清楚，腔外生长

间质瘤



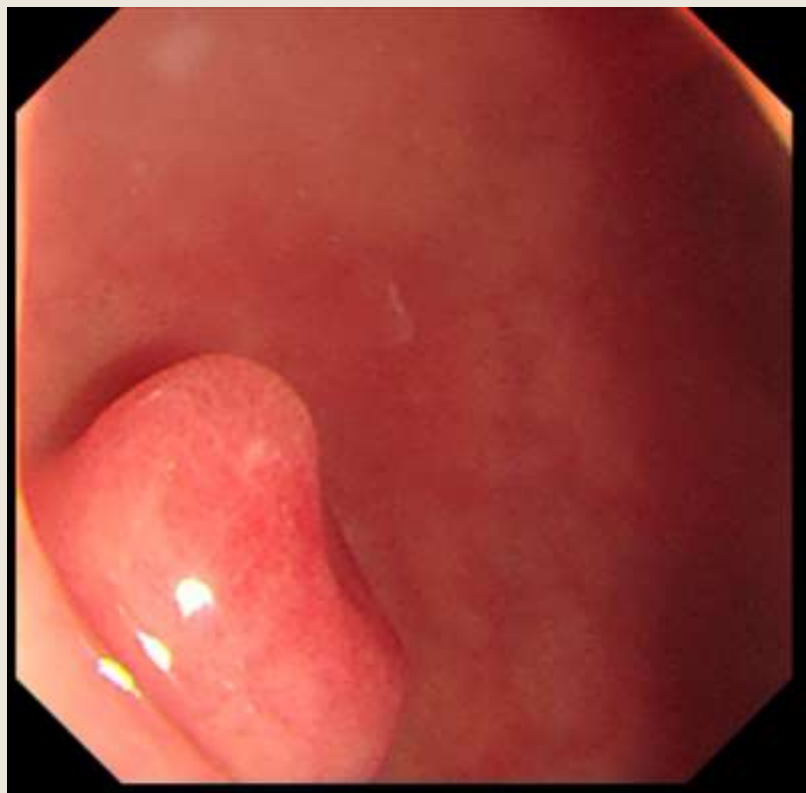
降部不规则粘膜下隆起，中央凹陷



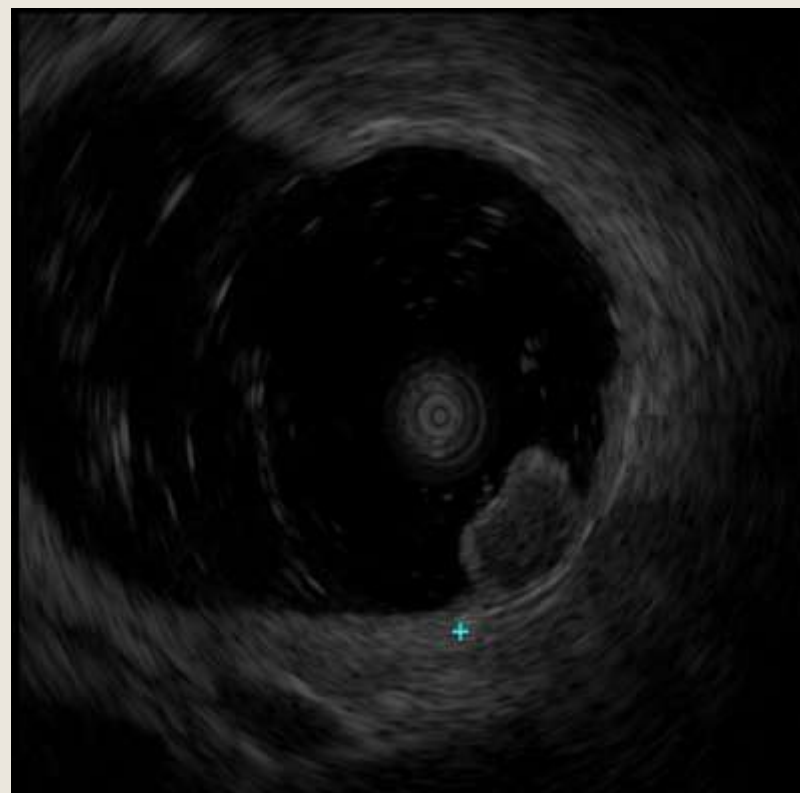
源于固有肌层，分叶状，内部回声欠均匀，边界清楚



神经内分泌瘤



球部前壁大弯侧息肉样隆起，表面充血，略凹陷



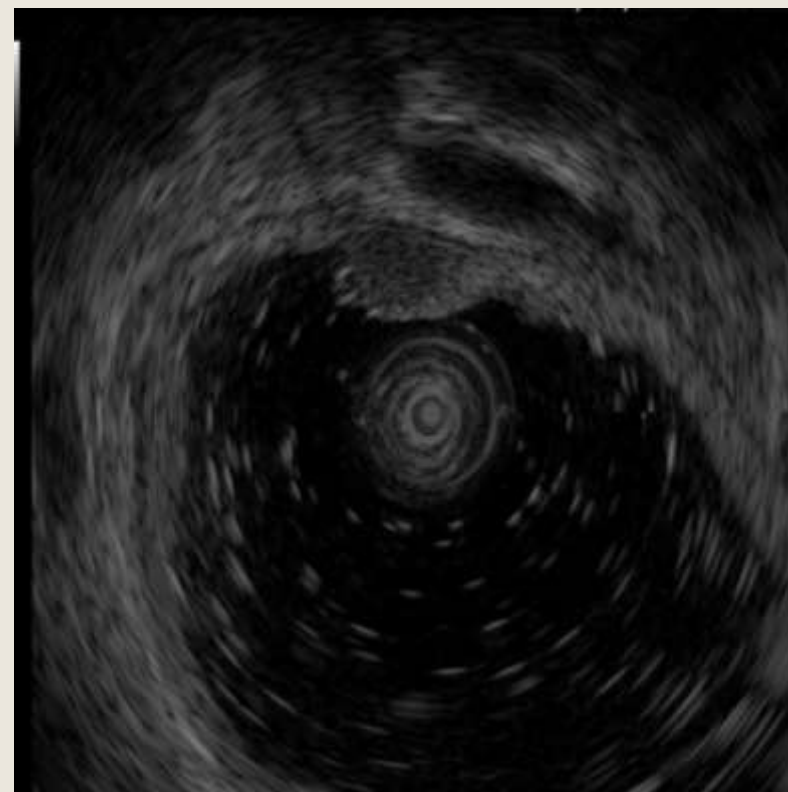
起源于第2层的低回声团块，边界清



神经内分泌瘤

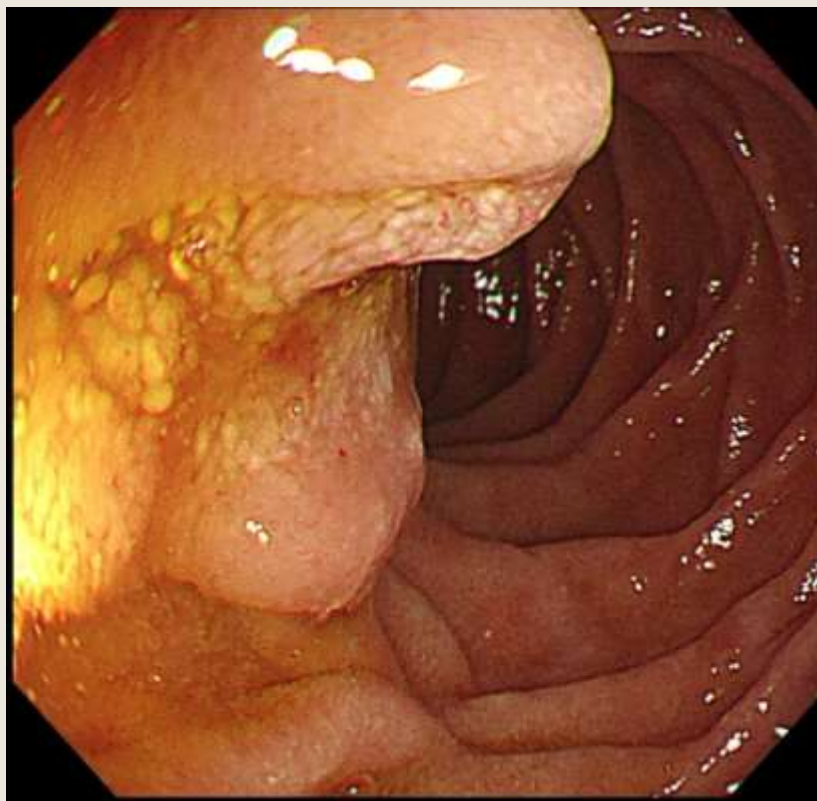


球部前壁近幽门粘膜下隆起，表面光整

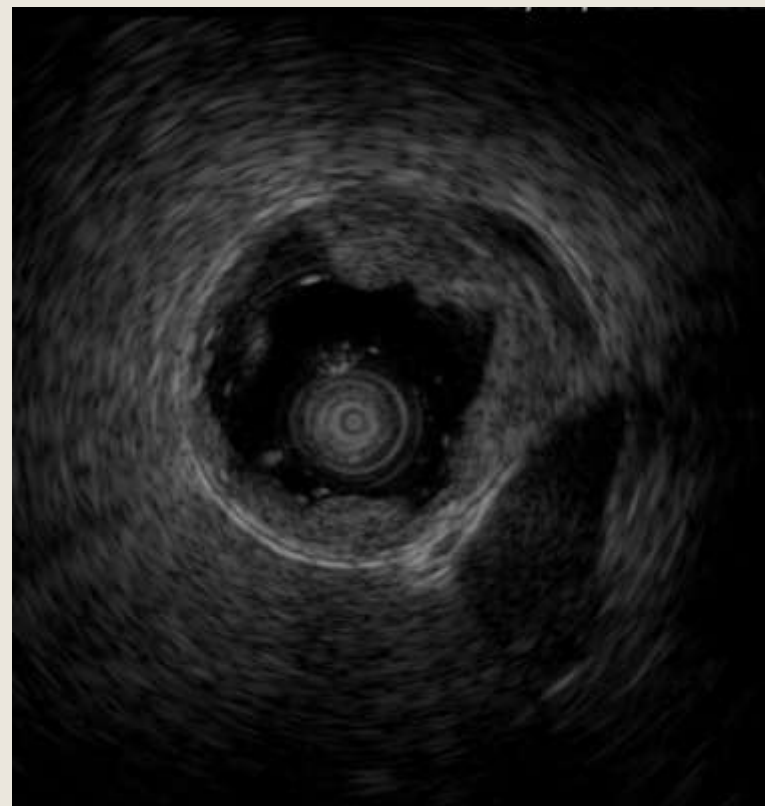


第2层的低回声团块，累及第3层

滤泡性淋巴瘤



降部盘状隆起，表面可见绒毛粗大

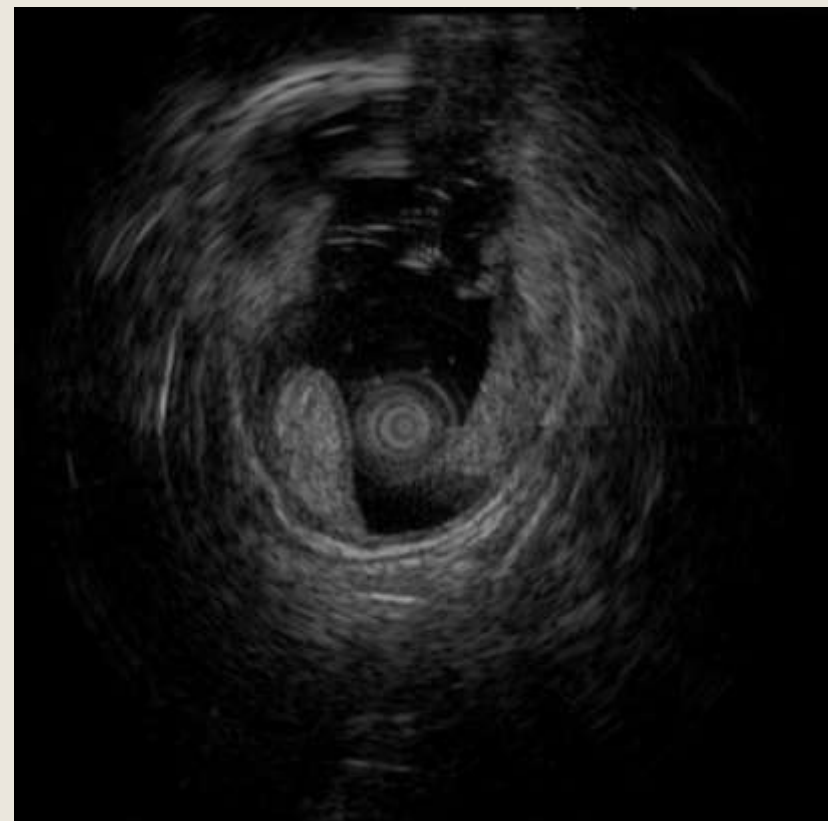


局部粘膜层、粘膜下层低回声增厚

脂肪瘤



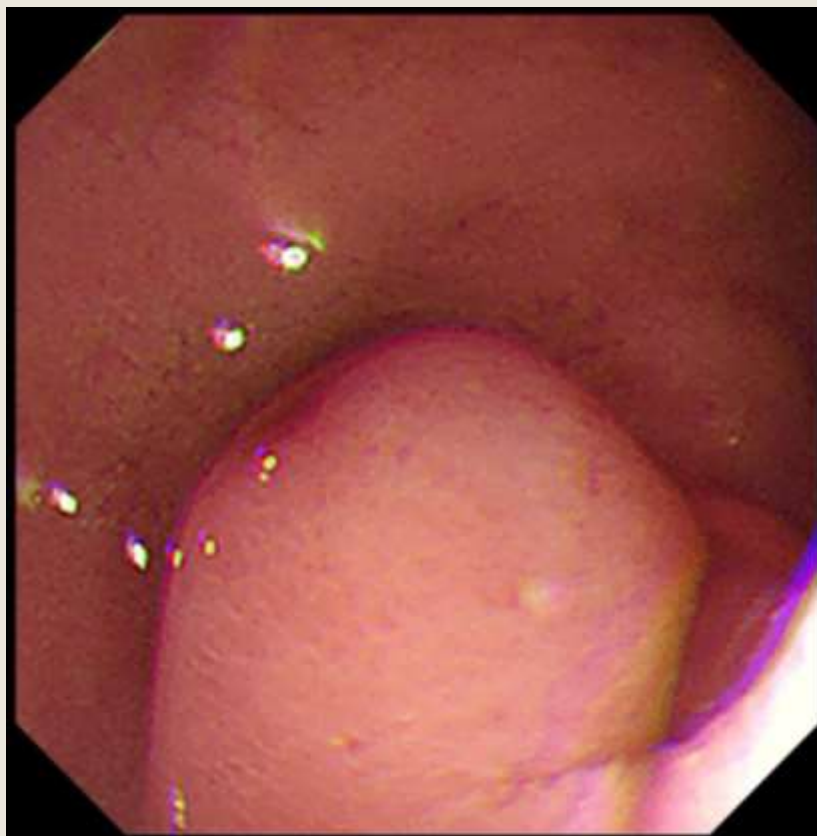
降部粘膜下隆起，表面光整，质软



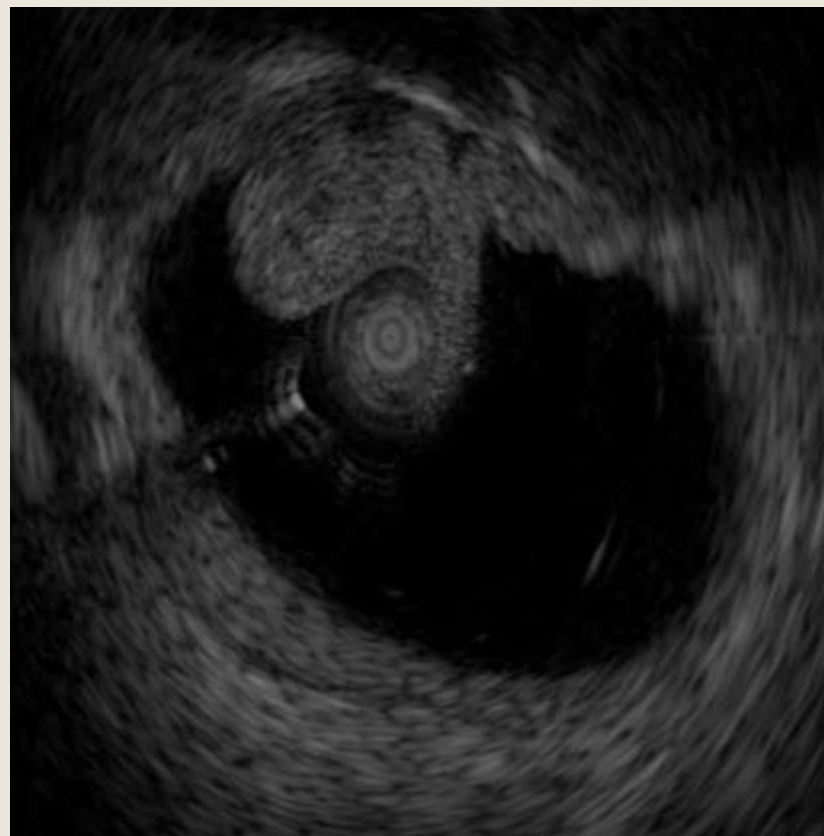
粘膜下层高回声团块，回声均、边界清



Brunner腺瘤

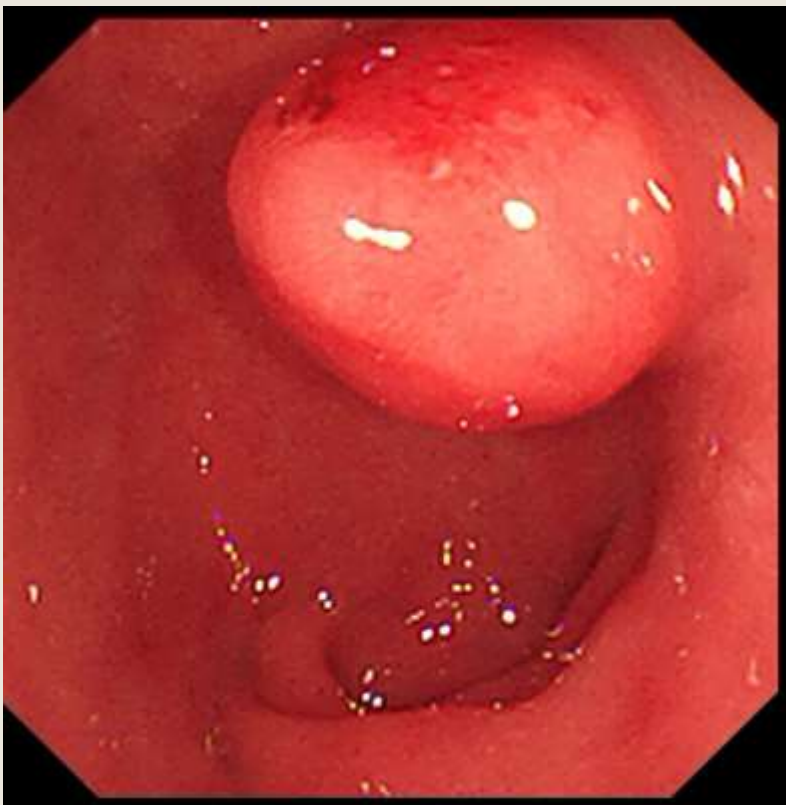


球部大弯侧隆起，表面光整

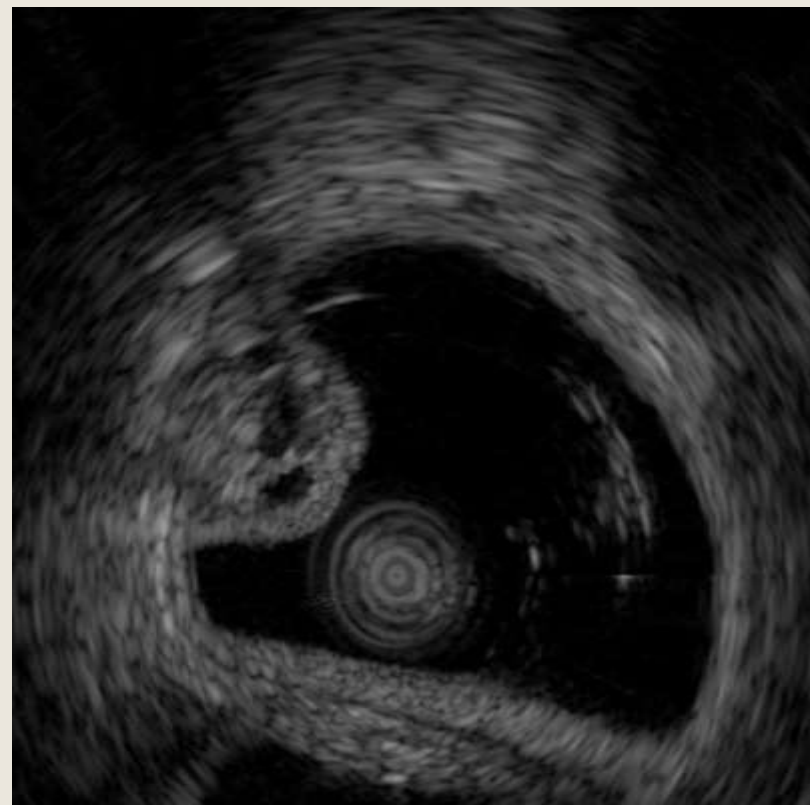


黏膜层、粘膜下层高回声区，边界清

Brunner 囊腺瘤



球部息肉样隆起，表面充血糜烂



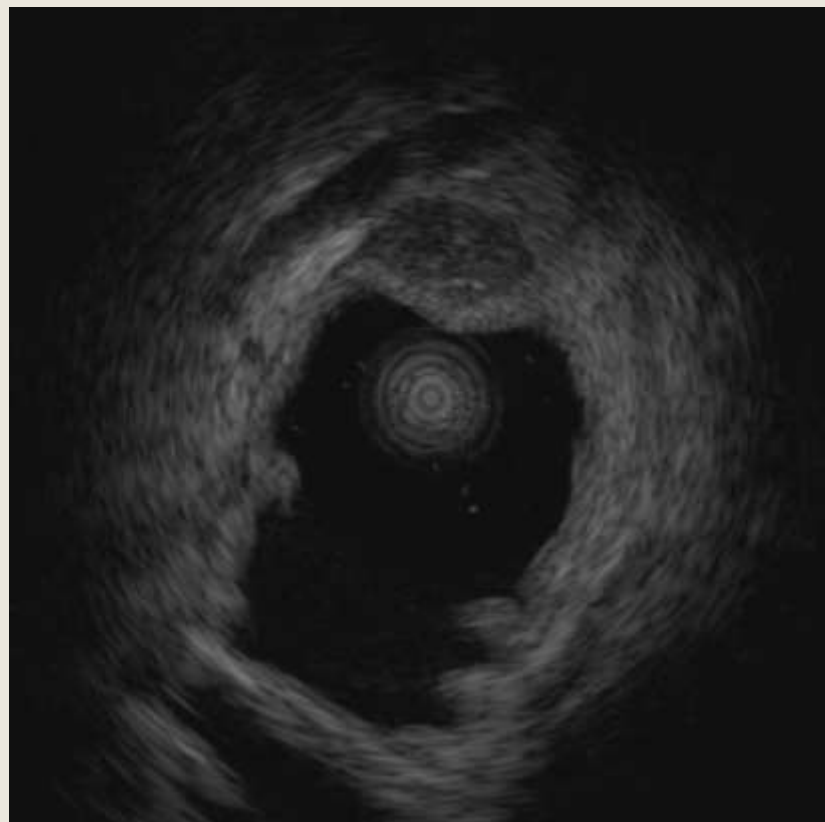
粘膜下层混合性团块，内见蜂窝状囊腔



异位胰腺



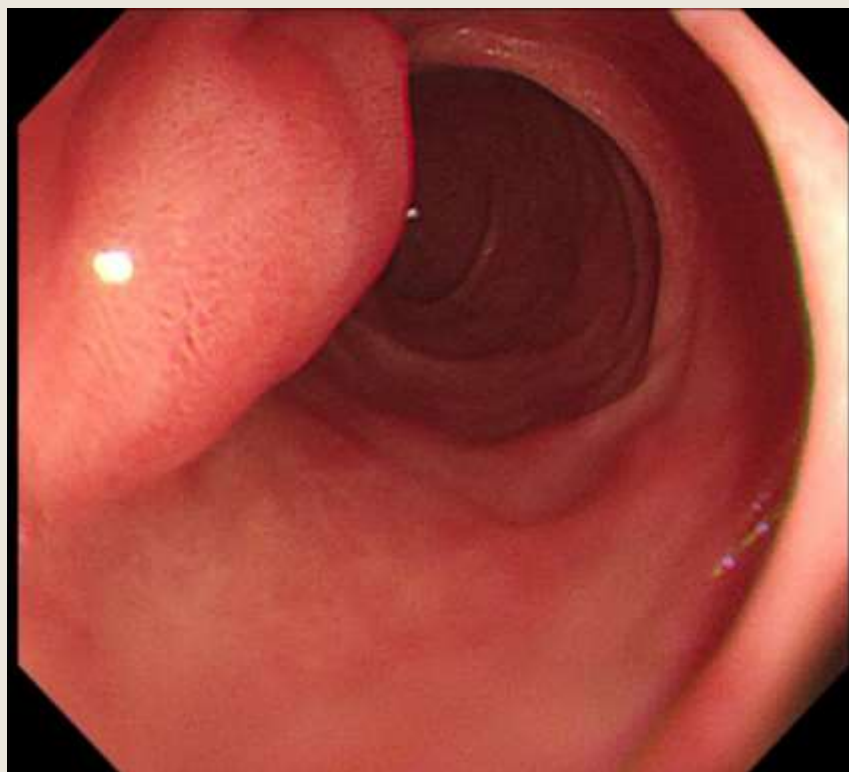
十二指肠粘膜下隆起，表面略凹陷



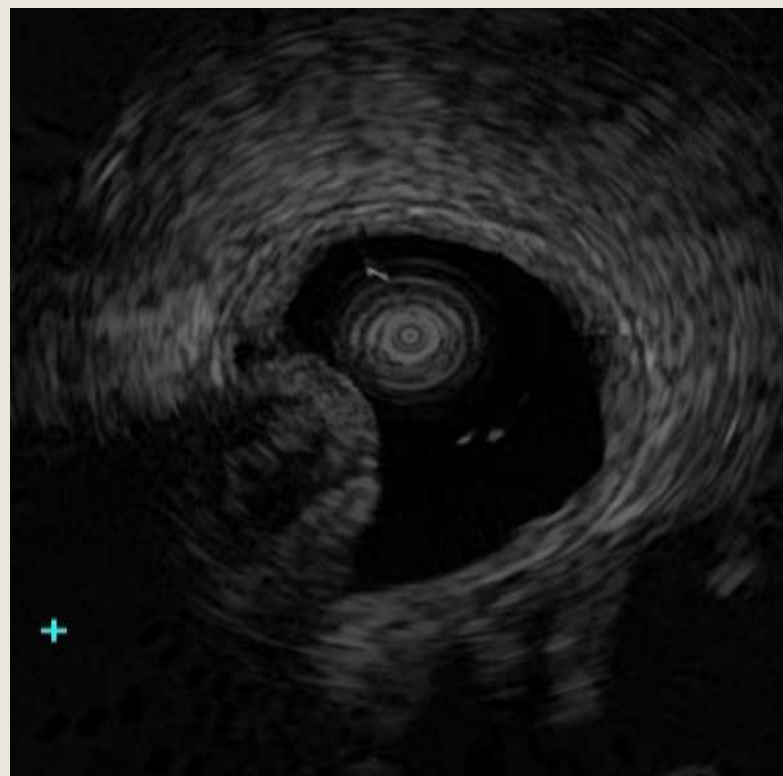
起源于固有肌层低回声团块，边界清，贴近胃十二指肠动脉，回声欠均匀，内可见点状高回声



十二指肠主乳头肿大



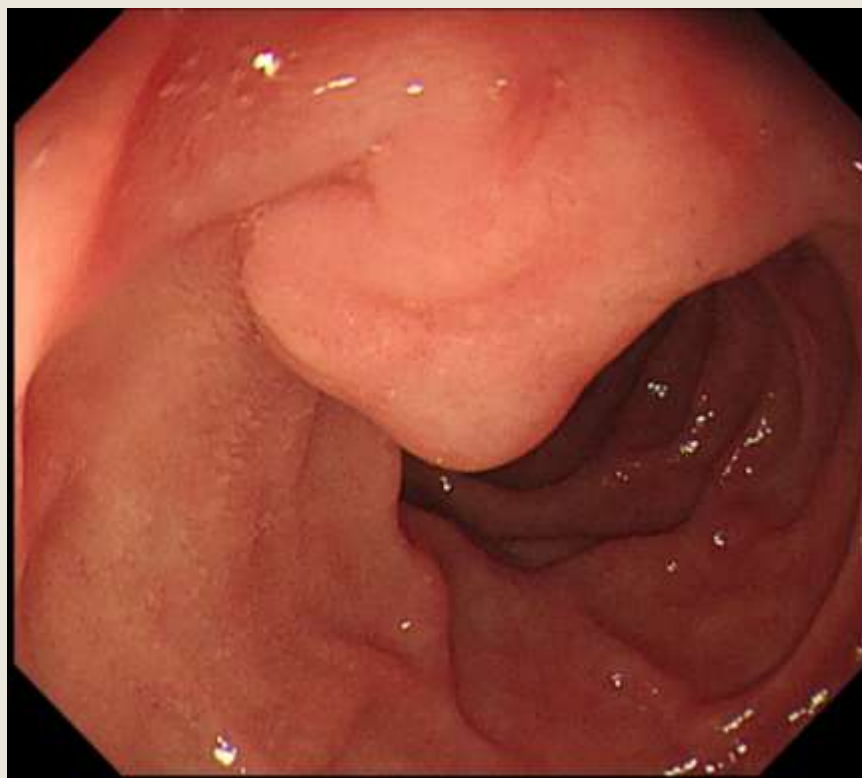
十二指肠乳头，表面稍肿、充血



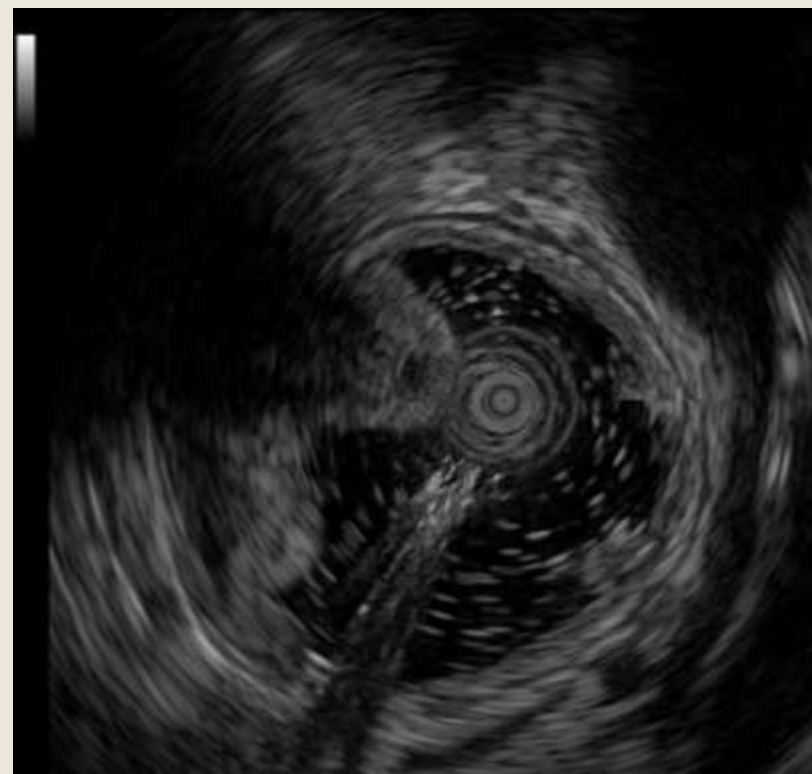
局部粘膜层粘膜下层正常，内部可见括约肌样低回声



十二指肠副乳头



降部主乳头口侧见一粘膜隆起



隆起处为壁内低回声，回声均匀，与胰腺相连，后方可见衰减，内部可见管腔样结构

THANKS



浙江大学附属第一医院
THE FIRST AFFILIATED HOSPITAL, ZHEJIANG UNIVERSITY
浙江省第一医院
THE FIRST HOSPITAL OF ZHEJIANG PROVINCE

Medicine is developed for happy life

医学的目的在于重获幸福